ON
BALDNESS
AND
GREYNESS

BY
TOM ROBINSON, M.D.

SECOND EDITION

E2 13

UNIVERSITY OF BRISTOL.

Medical Library.

PRESENTED BY

John Wright and Sons, Ltd

March 193[illegible]

Store [illegible]

Digitized by the Internet Archive
in 2015

https://archive.org/details/b21444377

BALDNESS AND GREYNESS;

THEIR

ETIOLOGY, PATHOLOGY & TREATMENT.

BY

TOM ROBINSON, M.D.,
(Physician to St. John's Hospital for Skin Diseases.)

SECOND EDITION, ENLARGED AND RE-WRITTEN.

London:
HENRY KIMPTON, 82, HIGH HOLBORN, W.C.,
AND 13, LAMBETH PALACE ROAD, S.E.

21868

CONTENTS.

PAGE

Chapter I.—Anatomy of the Hair - - . 1
THE HUMAN SKIN - - - - - 1
THE MUSCLES OF THE SKIN - - - - 4
NUMBER OF HAIRS - - - - - 11
WEIGHT - - - - - - - 11
HAIR INTERMEDIATE - - - - - 11
Chapter II.—Physiology of the Hair - - - 14
GROWTH AND DEVELOPMENT - - - 14
HAIR AS AN ORGAN OF TACTILITY - - - 17
TEMPERAMENT - - - - - 18
DOES THE HAIR GROW AFTER DEATH ? - - 19
TRANSPLANTATION - - - - - 19
HAIR STANDING ON END - - - - 22
RATE OF GROWTH OF HAIR - - - - 25
SHEDDING OF THE HAIR - - - - 26
NUTRITION OF THE HAIR - - - - 26
PERMEABILITY OF HAIR - - - - - 28
TRANSPIRATION OF THE HAIR - - - 29
NERVES - - - - - - - 32
Chapter III.—Colour and Texture of the Hair - 33
EXCESS OF PIGMENT - - - - - 34
HAIR AS A RACE-CHARACTER - - - 35
CHANGE OF COLOUR - - - - - 42
ANALYSIS OF COLOURATION - - - - 42
SPOTTED HAIR—SPECKLED HAIR - - - 43
SUDDEN BLEACHING - - - - - 44
CASES OF HAIR ELECTRICITY - - - - 45
DARK HAIR - - - - - - 46
COLOUR - - - - - - - 47
PARTIAL ALBINISM - - - - - 49

PAGE
CHAPTER IV.—ALOPECIA - - - - - - 52
CONGENITALIS - - - - - 53
SENILIS - - - - - - - 55
PRŒCOX - - - - - - 60
PARASITICA - - - - - - 65
TINEA FAVOSA - - - - - 67
TINEA TONSURANS - - - - - 75
ALOPECIA AREATA - - - - - 80
SYCOSIS, MENTAGRA, CHIN WHELK - - - 88
SOMATICA - - - - - - 93
SYPHILITIC ALOPECIA - - - - - 95
FOLLICULARIS - - - - - 97
UNIVERSALIS - - - - - - 100
CHAPTER V.—CANITIES, PILIOSIS, GREYNESS OR HOARINESS OF THE HAIR - - - - - - 108
ETIOLOGY OF CANITIES - - - - - 109
CHAPTER VI.—CRINAL ABNORMITIES—PLICA POLONICA AND SOME OTHER AFFECTIONS OF THE HAIR - 117
AFFECTIONS OF THE TEXTURE OF THE HAIR - - 118
SPLITTING OF THE HAIRS - - - - 119
FEATHER DISEASE, OR PHAGMESIS OF THE HAIR - 119
RINGED HAIRS - - - - - 120
COSMETICS - - - - - - 121
HAIR-DRESSERS AND BARBERS OF THE ANCIENTS - 123
HAIR COSMETICS - - - - - - 124
DEPILATORIES - - - - - 124
CHAPTER VII.—TREATMENT - - - - 131

PREFACE

TO THE

FIRST EDITION.

I HAVE endeavoured in bringing out this little work on Baldness and Greyness to make the matter as interesting as I could to the student, and at the same time have curtailed as much as possible, consistent with utility, all pathological and descriptive details; and, secondly, I have avoided expensive illustrations. I am of opinion that careful and plain descriptions, attentively and carefully perused, possess great advantages over engraved illustrations (unless executed with extraordinary skill and at enormous expense), and for this reason I have not added to the following treatise any coloured or plain drawings.

I can only express a hope that my effort may afford some help to those who are interested in the matter which I have endeavoured to illustrate.

19, Guilford Street, Russell Square, W.C.
May, 1882.

PREFACE

TO THE

SECOND EDITION.

THE reception of this work, and the necessity for a new edition, have ratified the impression I held at the commencement of my labours, that a work on this subject was needed.

I have not deviated from the principles of treating the various diseases propounded in the first edition, but the result of more extended observations has given me more material to draw from and reason from; hence, much of this edition has been re-written and extended.

19, GUILFORD STREET, RUSSELL SQUARE, W.C.
November, 1883.

BALDNESS.

CHAPTER I.

ANATOMY OF THE HAIR.

THE HUMAN SKIN.

BEFORE proceeding to the structure and functions of the Hair, we must premise some observations on the nutrient soil in which the Hairs are implanted, namely, the Skin. The outer covering of the body, having to serve at once as a protection for the more deeply-seated structures and as an organ of tact, touch, secretion, and excretion, is necessarily not only a very compound tissue, but also a very complex apparatus.

The skin mainly consists of two parts, viz.: the true skin (*cutis vera* or *corium, derma*) and an external layer named the scarf-skin (cuticle or *epidermis*). The true skin, which rests upon a layer of fatty and cellular tissue, strong, tense and tough, is nevertheless highly elastic and yielding, and being composed of fibro-cellular tissue, interwoven in all directions, numerous spaces or areolæ are formed, which, in the deeper layers of the skin, usually contain little masses of fat. The surface of the true skin is beset with small eminences named *papillæ*, which appear chiefly to contribute to the perfection of the skin as an organ of touch, as we find them highly developed in parts where the sense of touch is exquisite, as on the hands and fingers.

The glands of the skin are of two kinds :—

The *sudoriparous*, or sweat glands, and the *sebaceous*, or oil glands. The sweat glands exist in all regions of the skin, but they are not equally abundant everywhere. Each sweat gland is supplied with a number of capillary vessels. The total number of these sweat or perspiratory glands has been estimated at nearly two millions and a half. Besides the perspiration, the skin also secretes a fatty matter by the sebaceous glands before mentioned, which exist in all regions of the body, though not equally numerous in all parts. The skin thus constitutes a vast emunctory, by which a large amount of fluids and gases is eliminated from the body.

The epidermis, cuticle, or scarf skin, forms a protective covering over the true skin. It is non-vascular, and insensible. The thickness varies in different parts of the surface from 1-12th to no more than 1-240th of an inch. It is thickest in the parts much exposed to pressure. The cuticle is made up of flattened cells agglutinated together. Many of these cells contain pigment granules, which are contained principally in the cells of the deep layer, called *rete mucosum*, or mucous web. Thus, the colour of the skin of the Negro, the European, and other races, owe their shades to the intermixture of the pigment cells in different proportions in the respective localities of their scarf skin. Generally speaking, according as the pigment cells are more limited to the lower surface of the Malpighian tissue, or are more massed together in an upward direction, so will probably the darkness of the skin proportionately increase. A Negro child is not born black, but of a nut-brown colour. The full colour does not, according to the late Pruner-Bey, appear till the end of the first year in the Soudan, and only in the third year in Lower Egypt.*

THE MUSCLES OF THE SKIN.

The muscles of the skin are, as is well known, of two kinds, the unstriped, and the striped variety. The latter presents, under the microscope, transverse *striæ*, which occur in all the muscles usually termed "voluntary," although not limited to these alone. These striated, or striped muscles, may be detected in the face, forehead, and nose. The non-striated muscles, which are far more abundant, are found to be connected with the hair follicles, and are called *erectores pili* (erectors of the hair). They exist in bundles, either on one or both tiers of the hair follicle, and they also more or less enclose the sebaceous glands.

The hairs are modifications of the cuticle. They are found on nearly every part of the surface of the body, excepting the palms of the hands and the soles of the feet.

---

* Vogt; Lectures on Man, edited by Dr. Hunt. Anthropological Society's Publication.

A hair consists of a *root* which is implanted in the skin; a *shaft* or stem, and the point. The root of the hair swells out at its lower end into a bulbous enlargement, which is received into a recess of the true skin, named the *hair follicle* (*folliculus,* a little pouch), which, when the hair is of considerable length, reaches into the subcutaneous cellular tissue. The hair follicle receives near its mouth the opening ducts of one or more sebaceous or oil glands, and consists in structure of an inner or dermic coat, which is continuous with the skin, and an epidermic lining continuous with the cuticle. The outer coat is highly vascular, and is abundantly supplied with minute nervous filaments. When a hair is plucked from its follicle, the cuticular lining, or its inner coat, commonly adheres to it, forming what is called the root sheath. The soft bulbous enlargement of the root of the hair is, by its base, attached to the bottom of the follicle, and this part of the follicle, which is in reality a part of the true skin, although sunk beneath its surface, supplies the material for the production of the hair. There is, at the bottom of each hair follicle, as Kölliker has shown, a vascular eminence, or papilla, similar to those found upon the surface of the skin, which is continuous with the dermic layer of the follicle, and being highly vascular, and no doubt suppled with nervous fibrils, is subservient to the growth of the hair. The *papilla* must therefore be looked upon as the most important part of the hair.

The *shaft* is covered with a coating of fine scales, covering a fibrous substance, which in most cases forms the chief portion, if not the whole, of the shaft. In many hairs the centre is occupied by a different substance, named the medulla, or pith, in which case the surrounding fibrous part is often called the cortical. The length and thickness of the shaft vary greatly in different individuals and in the various races of mankind, and also in the different parts of the body. The shape of the hair shaft has been differently described by different authors, so that Leuwenhoek, the microscopist, said, "in many hairs as many shapes" (*quot crines tot figuræ*). Modern researches have shewn that the human hair is seldom round, but rather flattened, so that its section appears oval or kidney shaped. The diameter of the hair has also been variously stated. It varies according to locality and age. Beard hair is from $\frac{1}{251}$ to $\frac{1}{300}$ of an inch; head hair, $\frac{1}{400}$, $\frac{1}{600}$ of an inch from a little child. The curliness of the hair depends, according to Weber, on its flatness; the flatter it is, the more it curls. The strength of hair depends upon its length, thickness, and flexibility. The microscope has, in short, revealed the fact that the hair is not perfectly cylindrical, nor a tube, as was long believed. Except at the base, into which the pulp enters to a variable distance, the hairs are perfectly solid. The surfaces of the hair are not smooth, but laminated—the laminæ being placed over each other in a slanting direction, like the scales of a fish. Hence, a hair drawn between the fingers from base to tip moves smoothly, but by reversing the motion the roughness will become perceptible.

The beard and all short curling hairs are flattened, and flatness and curliness are in direct proportion. Both attain their maximum in the Negro. The medullary substance (medullary canal) is not regularly met with in all hairs. This constituent is absent sometimes in head hair, and almost constantly in woolly hair. In dark hair this substance is only seen after long hair has been bleached by diluted nitric acid. The medullary substance may be isolated by boiling the hairs in caustic soda, and teasing them. Falk and Henle asserted that no medullary canal is met with in the hair of children under six years. Œsterlin* denies this, as he had found it in the hair of children of only two years old. Œsterlin also dissents from Pfäff, who considers the medullary strand as the chief carrier of the hair pigment. He agrees with Griffith, Mandl, Kölliker, and others, that the supposed black pigment is simply air, but where these air bubbles have their seat, and what is their physiological significance, is as yet an open question. The medullary substance, where it exists, is not always in the centre, but sometimes at the margin of the hairs, which is especially the case in flattened or triangular hairs. Sometimes, says Pfäff,* the medullary substance forms in one and the same hair two pigment strands. The medullary substance does not in all hair form from point to root a continuous accumulation of cells, but there are seen at intervals cells which are filled with masses of the internal cortical substance, which by their texture form a marked contrast to the roundish cells of the medullary substance. Under these circumstances we cannot, strictly taken, speak of a medullary canal, as the medullary substance by no means fills the centre of the hair in its whole length.

---

* Das Menschliche Haar. O. Œsterlin. Tübingen. 1870.

The eyebrows have a length of about from two to three inches; they lie in an oblique direction above the orbits. Anatomists have divided the arches which they form into the head, the body and the tail. The head commences at the root of the nose, and sometimes coalesces with the head on the opposite side. The body extends along the orbit and the tail terminates at the temple. The eyebrows approach more or less, and sometimes seem continuous. The individual hairs of the eyebrows are cuneiform, stiff, short, thick and lustrous, terminating in a thin point. Whatever be the form of the eyebrows, it necessarily depends on the form of the orbital arch of the frontal bone; the more gentle the arch towards the temple, the more pleasant its form.

The eyelashes (*cilia*) are like the hair of the eyebrows, short curved hair. They are arranged in two or more rows along the edges of the eyelids at the line of union between the skin and the conjunctival mucus membrane. The lashes of the upper lid are both more numerous and longer than the lower. The hairs of the upper lid are curved upwards, those of the lower curved downwards. The rows of the cilia vary; there are sometimes four rows in the upper eyelid. Both the cilia and the supercilia are distinguished from the rest of the hair by the definite degree of their growth, by their slow reproduction which, when they are cut, is not effected until the lapse of two years to recover their previous length. Finally, the eyelashes rarely become grey, and moreover, proceed by way of exception, straight from the skin; all the rest take a slanting direction, more or less. This is best seen in the crown of the head.

Number of Hairs.—As already stated, the hairs are unequally distributed on the human body. In most cases the head is the most hairy part. Withof found in a moderately hairy middle-aged man, in a quarter square inch of the top of the head (*vertex*) 293 hairs, on the back of the head (*occiput*) 225, and on the front part (*sinciput*) 2111; on the chin 39. But the numbers vary considerably, according to age and colour. Upon the surface of a quarter of an inch Withof found black hair, 147; brown, 162; and blonde hair, 182. It seems, therefore, that black are the thickest, and blonde the thinnest. The number of hairs on the face, whiskers, beard and moustaches, varies greatly in races and individuals.

Weight.—The weight of the hair naturally depends upon its length and thickness. It is rare that the head hair weighs more than 12 ounces, although in a few instances it has been found 14 and 16 ounces. Absalom's hair "polled" once a year is said to have weighed 200 shekels; according to Geddes 112 ounces.

Hair Intermediate.—Oken observes that

the hair formation forms the connective link between animal and vegetable tissue. His words are : "The fur is the peripheral connection between the plant and the animal. The hair forms the summit of the vegetables. As the plant requires air and light, in the animal kingdom the hair appears where it is most exposed to those elements, namely, on the surface. It is not a little remarkable that those mammals which stand nearest to men, the anthropoid apes, are distinguished by their great development of the capillary system."

The ancients appear to have had a fair knowledge of the structure, growth and use of the human hair. Pliny (Lib. xi. c. 94), says : "The hair of man is partly born with him, and partly produced after his birth. The hairs that issue from a thick skin are coarse. When cut, the hairs shoot out from the place where they have been cut, as is the case with grass cut at the root. The hair also grows quickly in certain diseases, especially in phthisis, also on the body in old age."

As regards the eyelashes, Pliny observes (L. xi. c. 59), "Man has lashes on the eyelids, and women daily stain them to add to their beauty. Nature, however, has provided the hair of the eyelashes with another view—as a protection of the sight against the approaches of insects and other objects."

The nails are like the hairs, growths of the cuticle, with this difference, that the uppermost or *horny layer* which forms the actual nail is more developed. The posterior part, which is hidden in the groove of the skin, is the root, the uncovered part is the body terminating in front by the *free edge.* That portion of the nail near the root which is whiter than the rest, is from its crescent shape called the *lunula.* That portion of the skin to which the nail is attached, and by which in fact it is generated, is called the *matrix.*

The growth of the nail is almost like that of the hair, effected by a constant generation of cells at the root and under surface. In consequence of the addition of new cells at the posterior part, the nail is made to advance, and by the opposition of similar cells on its under surface the nail grows in thickness. The nails, like the hair, grow more in summer than in winter time, and they also appear to differ in growth in each finger.

CHAPTER II.

PHYSIOLOGY OF THE HAIR.

GROWTH AND DEVELOPMENT.

IT is about the end of the third month of intrauterine life that the hair begins to form, when it appears in the shape of minute black spots beneath the cuticle. At the period of birth, the head hair varies in length from one to four centimetres.* As occasionally infants are born with teeth, so are there sometimes babies born with a "shock head" of hair. Commonly, the hair is very scanty at this period, and only thickens towards the end of the first year. The dimensions which the hair acquires at a later period greatly vary, according to the constitution, sex, race and descent of the individual. It is well known that the female hair attains a greater length than that of the male. Grellier* supposes that this is owing to the greater abundance of cellular tissue beneath the scalp, so that the hairs find on the female head a more congenial soil for their nourishment and development, while Dr. Lewis Grion attributes the difference in the two sexes to the accumulation of electrical excitants in the female. Numerous cases are recorded of ladies whose hair reached the length of six feet, and swept the floor. The writer of this treatise saw a few years ago a young lady promenading at Yarmouth jetty, rejoicing in a *bonâ fide* crinal appendage more than five feet in length. The mean diameter of the hair is, according to E. H. Weber, 0·04 of a line. This diameter depends chiefly upon the colour of the hair. A square inch of scalp contains, according to Withof, 5,072 black, 608 brown and 790 fair hairs. The number of hairs upon the head will therefore vary according to their hue, and it has been found that while a flaxen haired beauty has from 140 to 150,000 hairs on her head, a black haired belle has only from 100 to 110,000, while a red haired one has only about 20,000 hairs on her head. The hair possesses great power of resistance, and is capable of supporting a greater weight in proportion to its volume than most of the fibrous substances. Weber says that a hair ten inches long is capable of being extended one-third of its length, and this elasticity is so great that after being elongated it recoils, and is but 1-18th longer than it was before the traction.

---

* A centimetre is equal to about two-fifths of an English inch.

---

* Dissertation sur les Cheveux. Paris, 1806.

Microscopic observation has revealed the important fact that the capacity of absorption and excretion possessed by the hair are about equal, and that the reciprocal action of the air and the living organism is not merely affected by the skin and the lungs, but that the hair plays a by no means unimportant part in the process. In baldness the hair has lost its excretory and absorbent canals. The harmony of the animal economy is disturbed, hence the organs, the skin and the kidneys perform vicariously the work of the hair. The scalp perspires much more than before, and in the urine is (for a considerable time) a sediment which previously to the loss of hair was not to be observed.

HAIR AS AN ORGAN OF TACTILITY.—Mr. Jobert in a communication to the French Academy, gives the result of his researches on the tactile faculty of the hair in different regions of the face. It is well known that in many mammals the hairs form a tactile apparatus of exquisite sensibility. He found that in man, the eyelids are provided with numerous nerves presenting very remarkable connections with the follicles of the eyelashes, so that the latter possess tactile facilities. The skin of the cheek bones, of the wings of the nose, of the lips and the chin, also possess hair with a nervous apparatus, though in a lesser degree than those of the eyelids. The nerves frequently accompanied by blood vessels, always enter beneath the sebaceous glands. The numerous connections of the nerves with the hair follicles force us to accord to these small organs a certain importance in appreciating the sensation produced by certain external objects, especially the movements of the air waves.

TRANSPLANTATION OF HAIR.—Tieffenbach

in his dissertation *Nonnullæ de regeneratione*, 1882, says that hairs may be transplanted from one organism upon another. He inflicted upon his own arm with a puncture needle several punctures and inserted six superciliary hairs taken from a friend. Of these six, two became fixed, two dried up and fell out, while two were expelled by suppuration. This suggested to him the artificial implantation of lost eyelashes, in which he several times succeeded. By transplanting some of his own head hairs on his arms, they became fixed, and the roots became strong and thick. Even of the white hairs of an old man, one became fixed.

TEMPERAMENT.—The mental disposition, and even the psychical strength is believed by many to be indicated by the hair. Black, curly, and stiff hairs are said to indicate a melancholy temperament; fair hair, a sanguine or phlegmatic temperament; and red hair, either a very cunning, or a very good character. Hence it was said we meet in prisons with many red haired women, and black haired men; rarely with fair haired criminals. Yellow or red hair is rarely found among maniacs. Very red hair sometimes indicates a scrofulous disposition. All this is, of course, subject to so many exceptions that it is scarcely to be relied upon.

The chemical composition of hair is nearly allied to that of the other horny tissues of the body, such as the cuticle and the nails.

Hair consists of carbon 49 to 50 per cent.; hydrogen, 6·66; nitrogen, 17·93; sulphur from 3 to 5 per cent.; oxygen, about 21 per cent. These quantities vary according to colour and other circumstances. Thus Bibra found in some specimens of red hair, the oxygen to amount to nearly 8 per cent.

Hair is indissoluble in water. Nitric acid turns it yellow; hydrochloric and sulphuric acids dissolve it, forming rose-coloured solutions. Many salts and metallic acids and also some organic substances change the colour of red or white hair to black. A solution of nitrate of silver in ether, or the same salt mixed with lard, oil, slaked lime, or pyrogallic acid is frequently used for blackening the hair.

DOES THE HAIR GROW AFTER DEATH? Opinions are divided. Old Heister (*Compend.*

Anat. 1741), denies that the hairs grow after death, as he had convinced himself by experiment *(sicut certo experimento edoctus sum)*, whilst Dr. P. Rommelius *(Ephem. Nat. Curios.* Dec. 11, Ann. VI.), is as certain that they do. Rommelius (obs. 226) records the case of a healthy strong peasant with green hair. He also gives cases of green sweat. In Ann. VII., obs. 155, we find the case of an old man of Kiel, whose hairs on the head were green. Borellus (Cap. ii., obs. 56) ; Bartholinus, Essert, and others, all speak of green and blue hair, which are now generally ascribed to metallic vapours.

To a certain extent the hair has an independent life. The growth of the hair after death has been, as is already mentioned by many physiologists, held to be fabulous. On the other hand, Villerme, *(Dict. des Sciences Médicales)*, tom. v., Bichat, and Puiset, insist upon the growth of the hair and beard after death. The latter gives the case of a father who, from affection, had kept the body of his son, and perceived that the beard after shaving had grown again. Bartholinus also relates that the cut-off hair of a corpse had grown up again yellow. In anatomical theatres frequent opportunities must occur to observe the phenomenon.

When the Parish Church of Turvey, Beds, was undergoing restoration in 1854, a large stone was raised which some three hundred years ago had been placed over the remains of the Lady Johanna, wife of the second Lord Mordaunt. Her remains appeared in a shroud of yellow silk, which retained its colour and firmness. Her dark auburn hair had grown so much after death as to fill up the space around, and form a mould for the head. N. and Q., vol. 6, 1870.

The following singular story appeared in Hawthorn's "English Note-book," vol. i., 96 :—"The grandmother of Mrs. H—— died fifty years ago, at the age of 28. She had a head of beautiful chesnut hair. When the tomb was opened, in 1853, her coffin was found to be filled with beautiful glossy ringlets, into which her whole substance seems to have been transformed, for there was nothing but these shining curls, the growth of half-a-century, in her tomb"

In Sir Henry Halford's account of the opening of the coffin of Charles I., in 1813, it is stated :—"The pointed beard so characteristic of the reign of King Charles was perfect. . . . . The hair was thick at the back part of the head, and in appearance nearly black."

Most of the old writers believed in the growth of the hair after death. Aristotle (Hist. an. Lib. iii. c. 11) says in the Latin translation : "*Etiam in senectute et defunctis pili augentur, sed non nascuntur.*" "We also see that in old age and in the dead, the hairs grow, but are not born." There is scarcely any author of the middle ages who did not believe it. Garmann (*De Miraculis Mortuorum*, lib. i.) says that the hair grows after death on all bodies of young persons, or of such who died a violent death. "In such cases," he continues, "the *nutrimentum capillorum* remained in excess." There are, nevertheless, not wanting respectable authories who utterly deny the growth of the hair after death. Ruysh Tesaur, 9, says, "*sepulcra intravi et nunquam contrarium observavi. . . . Vide nec capillos* *crevisse nec ungues post mortem,*" &c. "I have gone into the graves, and have never observed the contrary. We may see that neither the hairs nor the nails grow after death." Among the modern writers we find that Haller (Elem. Physiol., § 18, t.v.) declares the phenomena to be an illusion. Garmann (*De Miraculis Mortuorum,* lib. 1. tit. 1. § 7) says that the hairs of criminals who were hanged in chains became grey. Similar instances are given in Ephem. Acad. Nat. Curiosorum.

Hair Standing on End.—The Rev. Dr. Andrews, of Beresford Chapel, who had been requested to attend William Probert, who had been concerned in the murder of Weare, for which Thurtell was hanged in 1824, writes that "On the morning of execution the culprit seemed anxious to listen and to join in the prayers. On leaving the cell, and going to the room where he was pinioned, he became excited, and the instant the executioner put the cord to his wrist to bind his hands, his hair—long, lanky, weak, iron-grey hair—arose gradually, and stood perfectly upright for some time, and then as gradually fell down."

That these phenomena are the results of fear and horror has been known for ages. Job iv. 13, 14, 15: "The hair of my flesh stood up." But it was not known that the hair follicles are provided with muscles and nerves. The muscular fibres are, by nervous influence, caused to contract, the follicle is protruded, and the hair it contains stands erect. The same effect may be, as is well known, produced by electricity. Cold as a physical agent, and listening to a horrible story, as a moral agent, will produce what is called a "goose-skin," which is simply the result of the contraction of the muscular fibres.

The epidermic coat of the follicle adheres so closely to the root of the hair that it commonly separates therefrom when a hair is pulled out. It is hence frequently called the "*root-sheath.*" It consists of two layers; of an outer more compact stratum; and an internal more transparent layer. The outer root-sheath corresponds with the mucous layer of the epidermis, and contains soft cells, including pigment granules, which can be distinctly seen in the follicles of the skin of the Negro. The inner *root-sheath* forms a firm transparent yellowish membrane, extending from near the base of the hair follicle, and near the mouths of the sebaceous follicles, where it terminates abruptly. It appears to be a homogeneous membrane, but when it is very closely examined, it is found to consist of two or three layers of cells. The outermost layer (Henle's layer) consists of long, flattened non-nucleated cells. The innermost next to the cuticle is known as Huxley's layer, and consists of one or two layers of shorter and broader polygonal cells.

Rate of Growth of Hair.—According to Krafft (Novi Commentarii), the growth of the head hair amounts in the year to $2\frac{4}{9}$ inches. Withof (De Pilo Humano) says it grows four inches within a year. Haller computes the growth at $4\frac{1}{2}$ inches within twelve months.

The experiments made by these Physiologists did not apparently rest on strictly scientific principles. Berthold is of opinion that the growth of the hair might be best observed in females, who have lost their hair in consequence of a fever. He found in such cases that in young females, say from 16 to 24, the hair grows at the rate of 7 inches in 12 months. The growth of the hair is greater in summer than in winter, and more copious during the day than during the night.

SHEDDING OF THE HAIR.—Kölliker affirms that after birth, a total shedding of the hair takes place by new hairs arising in the follicles of the downy hairs, and gradually displacing the old ones. He also thinks that in many children the hairs of the head fall out from two to six months after birth, and are replaced by new ones. As in the earliest periods of life, the cast off hairs are replaced by new ones, so we find something similar, occurring at a later period, and it is quite certain that during the vigorous period of life, there is a continual replacement of the numerous hairs, which are shed. When the hairs which have fallen out after a severe illness are reproduced, it is more probable that they are developed in the old follicles than that they are entirely new formations; since, according to E. H. Weber, the follicles of cast off hairs continue to exist for a long time.

NUTRITION OF THE HAIR.—The mode of nutrition of the hair may be observed by taking from a body, a piece of hairy skin, and examining by means of a microscope the subcutaneous tissue. All around the bulb, we see the finest loops of the capillary blood vessels, and also off-shoots of capillary vessels, which are imperceptibly lost near the hair bulb, and form no doubt the intervening link between the soil and not only the plant, but also the medium between the atmospheric, electric, or may be miasmatic conditions of the external world with the organism. Analogous to the capillary vessels, the most delicate nervous plexuses send processes to the bulb. True, the human eye as yet, has not been able to follow these nervous threads, but that they reach the bulb, there can be little doubt. The pain on pulling the hair decides this. We are aware that the least highly organized tissues are capable of being reproduced, after having been destroyed. Cases have occurred that when the original stock have been destroyed in the scalp, a new stock may be developed by the powers of nature, and that an entirely new crop of hair arises, and so it is with the teeth. Dr. Curran related to Dr. Graves that Mrs. Waterworth Curran's grandmother who died aged 95, when about 80, got a complete new set of teeth. In Easton's work on longevity, particulars are given (from manuscript) respecting one Mary How, of Mapleton, Derbyshire, who at the age of 110, got several new teeth, while her hair resumed its former colour. John Minnerker of Maryport, Cumberland, had such an abundant crop of new hair, between his 80th and 112th years, that twenty wigs were made of it during that period.

Permeability of Hair. — Physiologists agree that the hair consists of matter somewhat analogous to horn or nail. For practical purposes, we may consider the hair to resemble a plant imbedded in the surface of the body, and consequently its healthy or diseased functions must be connected not only with changes occurring in the hair and its bulb, but with those which take place in structures more immediately in contact with the latter. Thus, the hair may cease to grow, and baldness ensue, as in old age, from decay and absorption of the bulb itself, or the same result may in youth be produced by causes which injure the vitality of the bulb or change the structure of the skin in which it is implanted. The fully developed hair although destitute of vessels is not a dead structure. The vital changes, says Kölliker, going on in it, are as yet shrouded in obscurity, but we may be assured that it is permeated by fluids, and employs them for its nourishment and maintenance. The hair must therefore be regarded as endowed with life, and dependent in a certain way upon the entire organism, not upon the skin in particular. The falling out of the hairs certainly depends in many cases merely on the want of the necessary natural material. The whitening of the hair is doubtless partly to be referred to the same cause. The well authenticated cases of the hair rapidly becoming white are interesting, and speak strongly for the vitality of the hair, although it is not yet known what peculiar processes in the elements of the hair occasion the decoloration.

Transpiration of the Hair.—It is a very old idea that the hairs act as flues which carry off noxious vapours from the head (Galen *de usu partium* cap. 19 *de pilis*). In fact all physiologists who were unable to indicate a special use of the hair assigned to it an excretory function. Haller believed that the hairs transpire at their points, and perhaps at their whole surface. Fourcroy thought that the use of the hair consisted in excreting an excess of phosphoric acid, which led Vauquelin to assert that the hair in various animals assumes the functions of urinary organs. This much seems pretty sure, that the hairs are subservient to the excretion of some substance either in gaseous or liquid form. It is because the hair possesses partly the function of transpiration, that it became the carrier of a contagion. Hence in cases of pestilential diseases, the greatest watchfulness is requisite at the introduction of hairy and woolly materials. That the hairs possess the power of condensating, so to speak, the electric fluid, and must be considered bad conductors of electricity is certain; and in so much as electricity plays an important part in all vital processes, the function of the hair certainly deserves greater attention than it has hitherto obtained from physiologists and pathologists. We know that the shaft of the hair is normally insensible, and may be cut, twisted, fixed, and bent in every direction, without giving rise to any sensation, neither does the shaft possess any independent motion. Under certain conditions nevertheless it seems to acquire both. Thus the hair, as we know, becomes erect under certain emotions, as well as under the action of electricity. That the erection arises from the action of the skin or the bulb is certain; but the question is whether the movement in the shaft be entirely passive, or whether the fluid be accumulating in the cellular tissue similar to that of the blood in erectile tissues.

That the hair is both idioelectric and hygroscopic is well known. Long ago Dr. Bridone obtained from hair by mere friction sufficient electricity to kindle spirits of wine, and several cases are cited of persons whose beards and hair became luminous when they were in a great passion. A singular case is reported by Dr. Lodere of a young man who among his black hairs had a tuft of dark red hair which turned scarlet like the crest of a cock, when he was in a passion.

Hairs being hygroscopic, they readily imbibe and give out moisture, and become longer or shorter according to the state of the atmosphere, and hence their employment as the barometers seen in toy shops.

Nerves.—Dr. C. Arnstein (Sitzungsberichte. Vienna, 1876), in a lecture "On the Nerves of the Hairy Skin," found in the human hair, especially that of the head, very frequently nerve-fibres in the sections, so that he does not hesitate to affirm that every hair is provided with a nerve. He also found the feather-bags of birds provided with nerves.

That the hair of Albinos differs chemically from normal healthy hair, has been proved by Sachs. He found that 500 grains of his own yellowish-white hair produced only from one to two grains of ashes which gave lime, 0.368; magnesia, 0.75; no iron and no silica, whilst a limited quantity of black hair produced 37 grains of ashes, which yielded 2.116 of lime; 0.9 of magnesia, and 0.2 grains of oxide of iron. King Hystaspes is said to have had a daughter of the name of Charidea, whom he would not recognize as such, because she had a perfectly fair skin and white hair. According to Pliny, Albania has received this name from Albinism being endemic in that country.

Chapter III.

COLOUR AND TEXTURE OF THE HAIR.

WE have seen that the colour of the skin resides in the epidermis or cuticle, so that the various shades presented by different races and individuals, are due to the comparative amount and relative admixture of the pigment cells. In the same way the colour of the hair depends on the amount of the pigment granules, diffused through the cortical substance of the hair. Thus, to take an extreme case, the entire absence of the pigment globules gives rise to that anomaly called albinoism or albinism.

Apart from the pigment granules, the air-vessels in the hair have recently much occupied the attention of microscopists, with regard to colour, as will be found in another place.

With some exceptions, we find that as a rule, the colour of the hair harmonises with that of the skin and the iris, although it is not rare to find red-haired ladies with brilliant black eyes. Black is undoubtedly the predominant colour of the human hair, and we consequently find it in all parts of the globe. Light hair with its various shades, from flaxen, light brown, chesnut, golden, to fiery red, belongs to comparatively few families of the human species, and these chiefly (though not exclusively) inhabit Europe, and the colonies established by Europeans. In Europe we find dark hair, as well as dark complexions, gradually diminishing as we approach the north until we reach Scandinavia, where light hair is dominant. Further north the hair again becomes darker, so that the Lapps and Esquimaux have dusky complexions and dark hair. This applies also to the antarctic zone.

Excess of Pigment.—According to Heusinger, the pigment may be so abundant as to soil the hand touching it. Ladies in southern parts sometimes complain that their jet black hair spoils their head gear, such cases are probably due to excessive transpiration.

In a paper on the colouring matter in human hair, read by Dr. Sorby at the Anthropological Institute, the author described the mode by which the colouring substances may be separated. Although four different pigments have been obtained, Dr. Sorby thought that the general colour of the hair is mainly due to black and brown red pigment, both of which may easily be obtained in a separate form, and used like water colours, as shown by many drawings exhibited. All the various tints which the human hair presents were due to a variation in the total or relative amount of the red and black pigments.

That latitude, light, and heat, influence to a considerable extent the colour of the skin and hair is undeniable, wherefore we find the deepest shades of black chiefly near the equator, whether it be in Africa, India, or America, but neither temperature nor the rays of the sun can be considered as the sole factor in the production of the deep colour of the skin and hair.

HAIR AS A RACE CHARACTER.—The colour of the skin and of the hair have always more or less fixed the attention of travellers and anthropologists with reference to the classification of the human species. Thus, as is well known, Blumenbach assumed five races according to their colour; the black, brown, yellow, red, and the white race. Dr. Prichard grouped them under three varieties, the melanocomous (black haired), the leucous, or white variety, and the xanthous or light haired. But the colour of the skin and the hair are insufficient to determine the character of a race. The formation of the skull, the length, smoothness, curliness, crispness, and general disposition of the hair must be attended to. Geoffroy St. Hilaire comprises, as does Bory St. Vincent, all the white, yellow, brown, and red races under *Leiotrichi*, straight-haired, and all the negroes, Negritos, Hottentots, and Bushmen under the woolly haired *Ulotrichi*. The occurrence of crisp and straight hair depends on the whole organisation.

Professor E. Haeckel (History of Creation) thought that the conformation of the hair is nearly as important as the character of language in the classification of mankind. He accordingly assumes twelve species of man, and their thirty-six races. Of these twelve species of man, the four lower species are characterised by the woolly nature of the hairs of their heads, every hair is flattened like a tape, and thus the section is oval. These four species of woolly-haired men *(Ulotrichi)* may be reduced into two groups, "tuft-haired" and fleecy-haired. The hair on the head of the tuft-haired *(Lophocomi)* Papuans and Hottentots, grows in unequally divided tufts. The woolly hair of the fleecy-haired men *(Eriocomi)*, on the other hand, in Caffres and negroes grows equally all over the skin of the head. All *Ulotrichi* or woolly-haired men have slanting teeth, and the colour of their skin and hair is always dark. They are more like apes than the *Lissotrichi* or straight-haired men. No woolly-haired nation has ever had an important history. In the eight higher races comprised as straight-haired, the hair may be much frizzled in some, but never actually woolly; each separate hair is cylindrical, not like a tape, and hence its section is circular, not oval. The late Dr. Pruner Bey, in his interesting essay on human hair as a race character, found on examining by the aid of a microscope the transverse section of hairs, that they were circular in smooth, oval, rather compressed in curly hairs, and elliptical and much flattened in crisp hairs. The more the hair is flattened the greater its tendency to curl, the more it approaches the circular form the smoother and stiffer it becomes. Considering that the smoothness, stiffness, and crispness constitute some of the most persistent characters in the types of mankind, it is in his opinion not altogether an utopian idea that the problem may be solved "given a human hair, to determine the race to which the individual belongs from whom the hair has been taken."

But while fully admitting that the structure and transverse sections of the hair form a chief character in the classification of the human race, I consider it rather hazardous to construct upon this single feature a complete system of classification. It is only when the cranial structure coincides with that of the hair, that a more satisfactory classification would be effected, otherwise the smooth-haired Australians must be accounted of the same race as the straight-haired Mongolians.

The character of the hair, especially that of the head, may be described as coarse, fine, smooth, straight, curly, waved, frizzly, crimped or tufted. With reference to the classification of human races, the form of the hair is certainly of more importance than the colour. The form of its transverse section is sometimes circular, sometimes elliptical. This much is admitted by all anthropologists, that in proportion to the flatness of the hair, especially if combined with great fineness, the greater will be its tendency to curl and become frizzly.

The curliness of human hair attains its maximum in the negro. It is not merely curly, but the individual hairs are extremely fine, and the roots are much smaller and lie more superficially than in the other races. That this crispness does not depend solely on the heat of the climate is proved by the straight hair of races living in other parts of the tropics. The Esquimaux and the Greenlanders have black hair, as have also the inhabitants of Tierra del Fuego.

Crisp hairs entwine themselves with one another more closely than those which are straight, hence negro hairs are better for felting.

Among the variations of the human genus, there are some who, as regards the structure of their hair, present a very remarkable appearance. Such are for certain the Cafusos and the Papuans. The Cafusos who are known to be descendants of an intermixture of the Aborigines of South America with imported negroes, present as described by the German travellers Spix and Martius, a most striking appearance by the excessively long hair of their heads, which at the point is half curled, and rises almost perpendicularly from the forehead about 18 inches, thus forming a prodigious and very ugly natural peruke, which at first sight seems artificial. This conformation of the hair causes a resemblance of the Cafusos to the Papuans of New Guinea. These large bushy masses of woolly hair attracted the attention of early voyagers, such as Dampier who called them "mop-headed." They are like the Cafusos or mixed races. They have neither the hair of the negroes nor of the malays, but hold a middle place between them. Their hair frizzles naturally which gives to their head an unnatural circumference. They have very scanty beards. The Papuans are as stated chiefly remarkable for the peculiar growth of their hair, from which their name is derived, for *Papuwah* or *puapuah* signify in the Malay language frizzled like wool. The growth on the head of these people, being very luxurious and crisp, forms a dense mop projecting from 6 to 12 inches from the skull. The hair of the Papuans has been generally described as growing in tufts, but Dr. Miklucho Maday and Dr. A. B. Meger both state that the hair of the Papuans is as evenly distributed on the scalp as in the case of the Europeans, and that the matting into tails is the result of the hair not being combed. In point of thickness of growth of hair the Papuans probably surpass all other nations, just as the North American Indians seem unrivalled in point of length of hair. Catlin (North American Indians, vol. i, p. 49) says that the hair of the Sioux or Dacotas reaches to the heels, and in the Crowheads it attained a length of 10 feet 7 inches.

The evidence in favour of the inheritance of the colour of the skin, applies equally, not merely to the general colour and texture of the hair, but to certain apparently tufting peculiarities in the disposition of the hair which reappear in the descendant.

Change of Colour.—The influence of disease on the colour of the hair is a demonstrated fact. Dr. Isoart narrates in the *Journal Complémentaire* that he had a patient whose hair was naturally exceedingly fair, but when she suffered from fever, her hair became red; after her recovery the hair resumed its usual colour. Alibert mentions the case of a lady who after a fever lost her beautiful fair hair, and that after her complete recovery the new crop was quite black. These and many other cases sufficiently prove that the secretion of the pigment in the hair, is closely connected with the animal economy, and that the condition of the hair deserves more attention than has been hitherto bestowed upon it.

Anomalies of Colouration.—The hair may be without pigment at birth, or may lose it afterwards. Congenital defect of pigment is noticed in the hair and eyes of Albinos, also in some of the lower animals, white mice, cats, etc. Besides the absence of pigment there occur other anomalies. The hair may be lost and be replaced by a crop of different colour, either darker or fairer. Richelot relates the case of a young lady whose hair during an attack of chlorosis, became quite grey two inches from the root. The rest of the hair remained unaltered. A cure having been effected by the administration of iron, the hair grew up brown again, the result was that while the lower and upper ends of the hair were brown, the hair was in the middle along a distance of two inches quite grey. Green and blue hair generally originate from foreign colouring substances, and have chiefly been observed among workmen labouring in metal manufactories.

Spotted Hair.—Speckled Hair.—Dr. Lieber of Berlin (Hecker's Lit. Aem. 1828) records a most remarkable case of the discolourization of hair. Emily B. *aet.* 16, with dark hair and dark skin, otherwise healthy, noticed at the period of puberty, on the left side of her face, a white stripe which crossed in an oblique direction the forehead, the eyelashes and the cheeks, when the menstruation proceeded regularly, the stripe disappeared, but the left eyelashes remained white, like those of a very old man. Before every menstruation, the white hair increased both on the head, and in the eyes, but disappeared when menstruation proceeded regularly. Dr. Vogel records the case of a man whose hair was grey on one side, and black on the other.

SUDDEN BLANCHING.—A well authenticated case of the sudden blanching of the hair is reported in Virchow's Archiv (April 1866) by Dr. Landois and Dr. Lohmer. The patient, a compositor, aged 34, was admitted into the hospital July 9th, 1865, suffering from an attack of delirium tremens. A marked feature in the disease was the extreme terror when any person approached the patient. Nothing unusual had been observed up to the 11th, but on the morning of the 12th, it was noticed with astonishment that the hair of the head had become quite grey in a single night. The patient was discharged Sept. 7th, the hair remaining grey. The hairs of this patient were submitted to microscopical examination.

The white hairs were found to contain a great number of air globules in the medulla, and in the cortical substance, but the pigment was in every case preserved. In connection with this case, Dr. Landois quotes instances of blanching of the hair, in which each hair presented alternate rings of a white and brown colour. A similar case was reported by Sir Erasmus Wilson to the Royal Society, on which occasion he presented a specimen of the hair of a boy aged 7, each hair presenting alternate rings of a white and brown colour; Sir E. Wilson refrained from speculating upon the cause of the alteration of colour. It should be stated that terror was very marked in Dr. Landois' case. In by far the great majority of recorded cases, intense mental emotion was apparently connected with sudden blanching of the hair, but the mechanism of the change, and how the air finds its way into the hair is far from being understood. It is more probable that the air globules are developed within.

Cases of Hair Electricity.—Among the other uses of the hair may be mentioned that it excretes electricity and perhaps other imponderable substances from the body, and absorbs other substances from the surrounding atmosphere. The electrical phenomena of the hair of some persons whose heads emit electric sparks in combing or brushing, and whose hair stands on end during electrisation, are sufficiently known. Generally speaking the more hair a man has, the greater the accumulation of electricity. The hairs in short are excretory organs; hence their abrupt and untimely removal may in some cases have serious consequences.

DARK HAIR.—Light hair seems gradually becoming less common, and consequently more appreciated in England than it used to be. Dr. John Beddoe of Clifton has collected large materials on the colour of the hair, and thinks it probable that the physical qualities of the race may be to some small extent moulded (we say it *is*, and that to a very large extent) by the action of *conjugal* as well as of natural selection. In order to test this hypothetical influence, he has thrown into the form of a table the colour of the hair of 737 women, aged between 20 and 50, who came under his observation at the Bristol

Royal Infirmary, and the deduction he made from the figures obtained, was, that the mass of the population does not sympathise with the preference given by painters and poets to fair hair; hence fewer of light haired women than of dark haired get married in that part of the kingdom. When Dr. Beddoe penned this article the rage for fair hair had not yet commenced, and the people in Gloucestershire and Somersetshire are on the whole a dark-haired race.

Colour.—The opinion that the colour of the hair depends entirely on the pigment in the medullary substance, is nevertheless still adhered to by many observers, although it has been proved by Griffith of London, Mandle, Henle, &c., that the supposed pigment molecules were chiefly minute air vessels, which fill the minute cellular spaces of the medullary substance. The colour of the hair is, thus, ascertained to depend solely on the diffuse pigmentation of the cortical substance, no matter whether the medullary substance exists or not. If this be so the cause of greyness is not due to the opacity of the cortical substance, preventing the visibility of the medullary pigment, but because of the disappearance of the diffuse pigmentation of the cortical substance. The real cause of this disappearance is as yet unascertained. The medullary substance we know is not a constant constituent of the hair shaft. It is frequently absent in human hair. This is especially the case in light hair, especially those on the head. The absence of the medulla in the hair, of new-born children, whose hairs are shed, is a certain fact. In short, the supposed black pigment is *air*. The medulla is not so frequently absent in the hair on other parts of the body. The hairs of the arm pit appear reddish even in dark persons: this is probably due to the acids of the sweat. The hairs, owing to the action of the human acids, frequently turn red, as has been frequently noticed in the hair of persons exhumed after many years.

The colouring matter of the hair consists in part of two kinds of pigment, granular and diffused. The colour of the hair is thus due partly to the imbeddal of granular pigment in and between the cells of the cortical fibres, and partly to the diffused pigment, which more or less saturates the cortical fibre cells. The papilla of the hair is probably the main spot where the pigment is produced. Another constituent of the colour of the hair is the air, contained in the air shaft and the medullary canal. Thus in senile canities in which the hair becomes gradually grey, the pigment also gradually disappears, but in sudden greyness the pigment is found preserved, but the grey places shew an abundant number of air vessels both in the medullary substance and in the cortical layer.

Partial Albinism.—Is comparatively a rare affection, and but slightly touched upon in text-books. This affection was well known to the ancients. Celsus gave the name of Vitiligo (from vitulus a calf) to all affections presenting anomaly of pigmentation. Willan was the first who distinguished partial from complete vitiligo. Bärensprung, Simon, and Beigel have latterly treated of this affection. It was formerly believed that apart from domestic and other animals, this affection was peculiar to the negro races. Blumenbach and Sonnini gave descriptions of such piebald negroes. Simon (*Deutsche Klinik* 1861) on the other hand asserted that partial albinism occurred more frequently in the Caucasian race. Beigel speaks also of a semi-albinism of negroes in whom some spots of the skin present an intermediate colouration between black and white. Bärensprung (*Deutsche Klinik,* 1855) maintains that partial albinism of which he had observed six cases in the white race, is almost always congenital, though only noticed at a late period. Rayer, on the other hand, is of opinion that in Europeans, at all events, partial albinism is always acquired. The ætiology of this acquired albinism is as little settled as the change of colour of the hair, especially in the sudden blanching of it. The modern name of leucoderma is equivalent to the term of partial albinism, which has been ably and exhaustively described by Mr. Jonathan Hutchinson, in his work on "Rare diseases of the skin." Alibert saw, during the "reign of terror" a young man turning suddenly grey during the night preceding his decapitation by the guillotine. Of the prince of Bèarn, afterwards Henri IV., it is said that during the Bartholomew night, having reposed on his hand for many hours in great anxiety, he found that the right part of his head hair and beard had become grey, an instance of partial albinism. That such sudden blanching is, as some will have it, caused by the action of morbid secretions on the outside of the hair is possible, but not quite probable. We know how by simply listening to a horrid tale we shudder, as is popularly said get a goose skin, and feel a horripilation. Most abnormal and involuntary manifestations in the skin, such as blushing, growing pale, shuddering, depend partly, if not chiefly on the sympathetic nerve. Terror is the chief cause in all cases of sudden blanching. Trousseau gives cases in which, from a neuralgia of the trigeminal nerve, the hair on that side had become grey. Labat *(Afrique occidentale)* says negroes suffering from long lasting diseases, become sometimes so pale that they can be distinguished scarcely from a southern European.

CHAPTER IV.

ALOPECIA.

ALOPECIA (from ἀλωπηξ, a fox, which animal like a dog with mange, is said to be subject to this affection,) signifies the falling off or loss of hair, whilst *calvities* signifies baldness. Thus alopecia may be said to be the beginning or evolution of the disease, and *calvities* or baldness represents the accomplished fact. The lower animals afford us numerous instances of periodical losses and re-acquisitions of hair and feathers. Animals with hair are said to slip their coats at certain seasons, whilst the feathered tribes are said to moult. In the human race the hair of the head falls to a slight degree in the summer and autumn.

The different forms of alopecia may be tabulated as follows.

Alopecia
- Congenitalis.
- Senilis.
- Præcox.
- Parasitica.
- Somatica.
- Follicularis.
- Universalis.

Congenital Alopecia is an unusual condition. I have frequently seen children born with a scanty crop of hair, but never with an absolute absence of hair; and I should doubt such an occurrence. Those cases which have occurred under my own observation have been the children of parents who have lived in an unhealthy situation, have had their family rapidly, and the children have often got their teeth late, and their *bones* have been thin and soft.

The following case, from my notes, will afford a typical instance of what I mean.

A male child, *æt.* 6 months, was brought to me for eczema of the groin and perinæum. The child had on casual inspection, absolute deficiency of hair, but on close examination small downy hairs could be seen here and there on the scalp, eyebrows, and external aspects of limbs. The condition was one which had not given the mother any anxiety. Her other children had a fair crop of hair when born ; this child was the seventh in ten years. It had a square head, large epiphyses; and night sweating, cried when taken up, and had been much subject to bronchial and internal catarrh.

I saw this child again when 20 months old, the hair system was then fairly luxuriant.

Children will often be brought because they have a deficiency of hair in one spot. I have a child under observation at the present time with a patch on the occiput where the scalp is occupied by a circle of hair which is short and stubbly, not unlike ringworm. This spot is exactly where the pressure of the pillow is most severe on the skull, and my patient, now 12 months old, has been laid much on the back.

Dr. Wyndham Cottle relates, in his work on the Hair, a curious instance of completely congenital alopecia, but he does not tell us for how long the patient remained under observation, or whether the hair grew at a later period of life. Rayer cites the case of a man with a congenital deficiency of hair, so that his cranium appeared completely bald. The man's father presented the same defect. Dr. Bauz (Stark's archiv.) records the case of a family in which the son was congenitally bald.

Alopecia Senilis.—Senile baldness is of such frequent occurrence among men of an advanced age that it almost seems a normal condition of the male head. Let any one, at the meetings of our learned societies, or from the galleries of the House of Lords or Commons, look down upon the heads of the members of the assemblies, and he will be surprised at the number of shining pates. As a rule the hairs are wanting over a space extending from the upper third or to the vertex, and laterally, near to the middle of the parietal region. No satisfactory explanation has as yet been advanced, why baldness, having arrived at a certain point, should be arrested in its advance, for whilst it denudes the portion of head wherein, it is assumed, the intellectual brain dwells, it spares the posterior portion of the skull.

The back of the head, the lower portion of the lateral regions of the skull, and the temple, retain the hair longest. Frequently, an anterior strip of hair remains at the upper border of the forehead, and this growth is often ingeniously used by bald people to hide their deficiency.

The scalp thus deprived of hairs looks smooth, bright, and shining. It is smooth, because the hair has been removed; bright, because it has been frequently polished by the process of scrubbing; and shining, because, in spite of the absence of hairs it is often oiled. The hair follicles, in the early stages of baldness, are perceptible; but when the disease has advanced, they are only here and there visible. Where they are seen, they are found to produce feeble, wool-like hairs, called *lanugo*. It has been urged that the baldness of the crown is attributable to the wearing of head-gear, which presses upon the blood-vessels, and diminishes the supply to the regions which are stripped of hair. But it is more likely to be due to the hair being kept away from the light. Sailors, butchers, and others who go about without head coverings are seldom bald. And I knew of an instance of baldness in a man, who was completely restored after he had been sheep farming in New Zealand, where he was in the habit of going the whole day without any hat or cap on.

Men are more frequently affected by loss of hair in old age than women. No explanation of this is known, but it may be due to their form of head dress, which covers less of the scalp, exercises less pressure upon the blood-vessels, and by not covering so much of the scalp, allows the light to have its full effect upon the unexposed portions. It cannot be due to their not devoting so much time to intellectual pursuits, as there is a very large number of deeply learned persons, as well as common and dissipated people, whose hair grows luxuriantly; whilst many others who think but little, and live contentedly and un-oppressed by care, lose their hair early in life.

The hairs in this form of baldness often turn grey before they are shed. It must, however, be understood that the alteration in colour in no way leads to alopecia. There are plenty of old people with luxuriant hair of the most beautiful silver grey. The hairs of the beard and other portions of the body do not fall out to any extent in senile baldness. In fact, a long white beard is often found in men whose pates are smooth and shiny.

The question as to what age we are justified in speaking of senile baldness may be answered as follows.

As a rule, baldness should not commence before the age of fifty. If it occurs before this age, it is either due to hereditary predisposition, or else it is due to some removable cause, such as disease of the scalp, sebaceous follicles, the invasion of a cryptogam, or diseased blood.

The question as to the cause of senile baldness cannot be answered in any other way than by saying that it is pathological senility.

If we examine the scalp of an aged person, who has been bald for some time, we shall discover a wasting of hair follicles, connective tissue, fat granules, and sebaceous follicles. The covering of the skull, in the bald situation, is then dry and shrivelled, and especially is this discoverable where the tension of the scalp is great, *i. e.* at the vertex of the skull or over the sagittal suture. But if we examine the scalp of a person advanced in years whose baldness is commencing, we will find hair follicles in many stages of atrophy: some producing puny hairs, others shrivelled up. This condition not producing complete baldness, patients rejoice over the downy growth upon their head. They are inspired with false hopes; and especially so if they have been using hair restorers, or coloured and scented oil, and have believed in the string of laudations accompanying each bottle. At this stage of baldness the sebaceous follicles are sometimes abundant; and it is not unusual to find bald-headed persons with very greasy scalps. As the disease advances, the hair follicles cease to produce any hair, and the papillæ, together with the follicles, actually shrivel.

These changes are simply the changes of declining life. They are changes of degeneration. The investigations of Sir William Gull and Dr. Sutton, undertaken to explain the association of granular kidney and general degeneration of tissue, proved conclusively that in advanced life the whole vascular area undergoes thickening of its coats, and eventually obliteration of the canals. And it is to this change that we must look for an explanation of the baldness which is associated with advancing life.

Alopecia senilis is not curable.

ALOPECIA PRÆCOX.

This name indicates baldness coming on prematurely.

It may be said that baldness occurring in persons under the age of thirty belongs to this class.

They may be divided into two groups.

Firstly: these cases which are due to a disturbance of the nervous influence.

Secondly: these cases which occur in individuals congenitally disposed to the loss of hair. A common case of baldness from fright is reported in the *Gazette des Hôpitaux*, No. 33, 1879. A girl, aged seventeen, who had always enjoyed good health, had one day a narrow escape from drowning, being crushed by a floor giving way beneath her. She was very much frightened, and the same night complained of headache and chills. The next morning she felt restless, and had itching of the scalp. During the following days, she steadily improved, with the exception of the itching. One day, on combing her hair, she noticed that it came out in great quantities. Three days later, she was perfectly bald, and in two more days she lost every hair on her body. Her general health was good. The patient remained bald, and was still so when seen by the reporters ten years later. In one instance a patient of mine narrowly escaped being burnt to death, and in her case the hair of her head was nearly completely shed, but it grew again. Those cases which occur in one area, supplied by one particular name, show clearly how the hair may fail through aberration or alteration of nerve influence.

Thus, Ravaton mentions the case of a man in whom amaurosis of the right eye, as well as loss of colour and shedding of the hair of the scalp, of the eyebrows and eyelids on the same side, resulted from a shock. Romberg saw bald patches develop on the head, and great suffering from a trophic facial palsy on the affected side.

Cooper Todd reports a case in the *Lancet* for 1869, in which, in consequence of a concussion of the brain from a fall, hemiplegia and alopecia of the hair of the beard and of the head occurred. Also another case in which the hairs and nails were shed after the patient had been struck by lightning.

No satisfactory explanation can be given of these forms of loss of hairs. In a later chapter we shall discuss the question of nerve influence on the colour of the hair.

It is undoubtedly true, nevertheless, that the hair is not infrequently shed through the influence of the nervous system. The shedding occurs quickly, and in all the cases which have come under my observation, unless there has been an organic lesion of the brain and spinal cord. The hairs have connexion as abundantly as ever.

Among the exciting causes of baldness are enumerated excesses *in Baccho et Venere.* Thus, Gumer gives a long list of bald Emperors and Kings who had distinguished themselves by their dissipated habits—Tiberius, Claudius, Galba, Commodus, Henry III. of France, &c.

The form of baldness which is found in the second group of *Alopecia Præcox* is well expressed in the following case:—

J. C., aged 25, is one of six children, four of whom are boys. He is the youngest. His father was bald prematurely at 24 years of age. Two of his brothers have lost their hair. He has now, from the occipital protuberance and extending forward, an absolutely bald pate. The skin looks shining, and very few hair follicles can be seen with a strong lens. He has a fair crop of curly, dark coloured hair above his ears, and below the occipital protuberance, which hair is not in the least grey neither does it come out easily. His eyebrows, axillary, and pubic hairs are strong and firmly planted, and he has a well-grown moustache. He has never had syphilis or any other blood disease, and with the exception of occasional attacks of gastritis, he is and always has been perfectly well. There is neither history or evidence of skin affection in his family.

I could multiply such instances to any extent, as the state is a most common one.

I will relate the notes of one more case, which is full of interest, and affords much room for speculation.

Mrs. S——, from Balham, is 55 years of age. She is one of four children. They are all away and well. Her mother died at 88; she had luxuriant hair. Her father died aged 72; was partially bald. She was perfectly well until the last seven years, at which period of her life she had an alteration of her menstrual function, the periods ceasing suddenly after a great loss. Since this she has got fatter, whiter, and weaker. She has great depression.

She is a large-framed woman, walks and talks slowly, answers questions very slowly. She has a stolid look. Her pupils are remarkably small and lazy. The whole subcutaneous tissue of the body seems hypertrophied, is dense, firm, and resisting; but it does not pit anywhere, excepting on her legs.

The joints of her fingers and toes have distinct horny lips, and are painful at certain times. She is sure that the weather and many kinds of food influence them. She has a constant noise in her head; it is like the noise made by a steam engine. This noise never leaves her. Her hearing and sight are normal. She has on her scalp a few long straggling hairs, but they grow at intervals, about eight or ten in a square inch. The hairs in other situations are normal. She lost her husband very suddenly, when her menstruation ceased, and she attributes her sufferings to this shock.

This is not a work which will enable me to enter into the discussion of MYXŒDEMA, on which the labours of Dr. Mahomed and others have so helped us, but I quote it as an instance of baldness in a woman who was free from any disease of blood or glands.

The growth of hair in women on the upper lip and chin, which occurs at what is known as the change of life, has been noticed from Shakespeare downwards by general writers, but, so far as I know, it has not been observed by physicians. It is an acknowledged condition, as is the growth of adipose tissue which so often occurs in women between the ages of 45 and 55.

ALOPECIA PARASITICA.

This little work not being a treatise on skin diseases, we can only notice such cutaneous affections as in their progress implicate the structure of the hair. Some cutaneous diseases are due, either to an animal parasite, or to the presence of a vegetable parasite. The former are called *dermatozoa;* the latter, *dermatophyta.*

The parasites which are formed in the interior of the body do not concern us here, nor those which merely affect the skin, such as the acarus or the different kinds of pediculi.

The following table, from the able work of Dr. McCall Anderson, of Glasgow, is very useful, and embraces the varieties which we will now discuss :—

I. *Tinea favosa* ...	Parasite, Achorina Schænleini.
II. *Tinea trichophytona*	Ringworm. Parasite, Trichophyton.
Varieties—1. *Tonsurans*...	Ringworm of the head.
2. *Circinata* ...	Ringworm of the body.
3. *Sycosis* ...	Ringworm of the beard.
III. *Tinea versicolor* ...	Chlorasma. Parasite, Microspora furfur.
IV. *Tinea* (?) *decalvans*	(Alopecia areata.) Parasite, Microsporon Andouini.

TINEA FAVOSA SYN. FAVUS.

Tinea vera, by Terry; *Mycosis achorina*, by Virchow.—The true nature of this disease seems scarcely to have been known to the Greek and Latin physicians, whilst the Arabs recognized it as a special malady.

In 1714 Turner proposed naïvely to divide all chronic skin diseases into two classes. That class affecting the body was included under the common name of *Herpes*, that affecting the scalp under *Tinea*. Willan finding the term *tinea* much too vague substituted that of *porrigo*, of which he admitted two varieties, *porrigo favosa* and *porrigo scutulata*, which Bateman, the pupil of Willan, further subdivided into six varieties, the names *porrigo facialis*, *tonsurans*, and *favosa*. This system prevailed in England, and mostly on the Continent, until in 1839 Schaenlein discerned in the scales of *favus* a vegetable cryptogam, so that *favus* was now considered a parasitic disease as much as itch. Since his date numerous pages have been written, both in this country and abroad. Still a great deal of diversity of opinion exists with regard to the parasitic diseases of the skin.

Some look upon the cryptogams as the cause of the disease, others as the consequence. There are others again, in England especially, who hold that there is only one vegetable parasite which produces different manifestations according to the situation in which it grows. They have considered that the *Microsporon andouini* represented the cryptogam in its primitive state, whilst the fungus of *favus* was the fully developed plant. The majority of dermatologists, however, recognise favus (or honeycomb ringworm) as a distinct species. The rapidity with which it grows, the typical and depressed cups, the mouse or apple chamber, odour, the way in which it dips below the skin, and clings to a hair, show it is a disease *sui generis*, as much as that is chlorasma. This species of favus do not take root easily. I have tried once to cultivate a favus cup, but although the plant was allowed to remain in the skin for four days, no result ensued. The example quoted by Anderson (p. 27) on skin diseases proves that the disease is capable of being transplanted, but that in some skins at least it does not take root. The lightness of the sporules has been ascertained by the beautiful experiments of Bazin, who collected particles of favus crust in a basin of iced water placed 50 centimetres from a patient with this disease. The patient sat in a direct line with the draught out of his basin, and was asked to frequently scratch his head, the result being that favus cups were detached, carried in the current of air, condensed and deposited in the iced water. Hebra inclines to the view that the various shapes of parasitic diseases are rather due to the development of the plant at the time the observation is made. Against this view is the striking clinical evidence that one does not meet with patients who have chloasma, common ringworm of the body, and scalp, sycosis and favus.

Individual instances are recorded where two or more have existed at the same time, but surely it is easier to believe how in these instances there have been two cryptogams planted and growing together. Dirt seems to be the most favourable condition to the growth of the *favus* germs, but it is not at all essential to their production. It is certainly rare to meet with it in those who are cleanly in their habits, and whose general health is good. This *à priori* is what the experiments teach. That it is necessary for the production of favus that the spores and soil remain for some time in apposition with the skin, and in those who know soap but seldom, exactly this state exists. Many dermatologists, and chief among them Duvergie, believe in the spontaneous generation of parasites in the bodies of the poor and dirty. He, and those who think with him, support this view by the fact that parasitic affections sometimes get well in patients who are put under good hygienic conditions and ordinary internal medicine. Doubtless such cases do occur. But that it is cause and effect is another instance of loose reasoning which makes all therapeutics so much the child of falsity. Those of his school argue that these cryptogams develop in and around hair follicles. Just as rational would it be to state that beds develop bugs. It does appear clear to one's mind that floating in the atmosphere are germs of disease, and that these germs want a suitable habitation. That this habitation, in the case of vegetable and animal cutaneous parasites, is often the product of dirtiness is undeniable, and finding this habitation there germs, or spores, or plants will settle down and grow. The ink I am now using may be left undisturbed for a few days, and will be covered by a minute plant. To argue that this plant came from the ink is simply advocating the theory of those who deny the parasitic origin of *favus* and allied maladies.

SYMPTOMS AND COURSE OF FAVUS.

The seat of Favus is generally the scalp, but it may attack any portion of the body where the hair grows. In a gentleman who is now under my observation, the disease commenced at the back of the neck, where I have seen ringworm commence in several instances, probably by sitting on a chair which has on the back the Favus spore, and these are brought in contact with the hairs. At first the disease consists of yellow scabs, looking like glue. These will be found on minute examination to be pierced by a hair. They can be detached and will be found to run up and down like the blocks used in the rigging of a ship. They are about the size of a pin's head. These bodies consist of masses of spores which develop in the mouth of the hair follicle. The skin around will be found slightly raised in places, and the centre of the cup depressed. As the masses of Favus grow, they coalesce until they form a complete crust on the scalp. If, however, the Favus and pits are separate, a curious formation takes place, which consists of rounds at first concave, afterwards convex. This dry sulphur-coloured scab consisting of a structureless capsule and of innumerable spores and branches. Gradually as the disease advances the hair follicles become overgrown by the fungi. The growth of the hair is interfered with, it breaks off short, becomes dry and brittle, and falls out. When these scabs detach themselves, the skin from pressure exercised by the cup halves, becomes atrophied, and is never repaired. The hair but seldom grows again upon the situations of the disease, and the papillæ having shared in the general atrophy, produce afterwards a very poor and thin layer of epithelium, and for the rest of the patient's life these remain upon the head, bald, depressed spots. The growth of the fungus, together with the irritation caused by the parasite which finds here a suitable habitation, often produce a great deal of inflammation of the scalp. It is not always easy to distinguish between the scabs of eczema of the scalp and a favus cup, especially when the two are combined. Generally, I believe always, a favus scab can be removed without pulling the epidermis beneath it, whilst the scales of the eczema leave behind excoriation. Favus attacks the head, as it has been said, more frequently than any other part. It may and does occur wherever there are hairs. Next in frequency to the scalp I have seen favus of the whiskers, moustache, and back, or in any situation where the plant is most likely to find an opportunity of growing.

Favus is a disease met with commonly among the lower animals, and there is every reason for believing that the domestic cat, which is frequently affected with the disease, often communicates it to the human being. An examination of the hairs in cases of favus with a low power even, demonstrates the existence of the fungus. Garlands of spores will be seen projecting from the hair like festoons, which in many and separate spores, can be seen splitting up the fibres of the hair. Favus attacks at the same time the nails, when it is known as *Favus ingenium*, a most intractable disease. It will also attack in rare instances the epidermis, when it is known as *Favus epidermicus*; when such is the case the mass of spots becomes hard, and in a few weeks falls off, thus curing the disease. It is interesting to watch a case of Favus in anyone who contracts in any way specific blood disease. In Fulwood's Rents, Holborn, a dirty court, I had an opportunity of watching two children who had typical favus of the head and scarlet fever, and with all its horrible, disgusting companions. During the height of the scarlet fever the disease appeared to fade. The lice multiplied with frightful rapidity, but when the fever had passed the malady flourished as luxuriantly as ever. The diseases most likely to be confounded with favus of the scalp are Psoriasis, impetigo capitis, and ringworm of the scalp, but if it is borne in mind that the crusts of Psoriasis are of a dirty chalk colour, are distinctly raised above the surface, and are always associated with

Psoriasis elsewhere, the distinction is easy, whilst in impetigo capitis the scabs are more uneven, more difficult to detach, and leave the epidermis abraded beneath them. The microscope will at once settle the difficulty.

TINEA TONSURANS.

Syn. *Herpes Tonsurans.* *Trichinosis Furfuraceus.* *Porrigo scutulata.* *Common Ringworm.* The Greeks described the pustule scars in the scalp under the name of *αχωρες*, the Latins preserved the name of *achores*, a word was probably given to diseases on account of the ravages produced by them in hair as a moth on fur. Almost every dermatologist has produced his own classification and specified a different nomenclature. To obviate the difficulty and confusion, many physicians wisely, I think, would confine the term *tinea* to diseases affecting the hairs. There is no doubt that ringworm of the head is a highly contagious disease in most cases. In many cases it may be determined by careful enquiry that the disease is transmitted to the human being, but that its transmission takes place between man and beasts. I have now under observation a groom with well marked *tinea* of his scalp and arms. He brought to me some hairs from a horse which I saw. These hairs were infested by a cryptogam which in no way differed from that which I found amongst his own hair. Much discussion has taken place as to the identity of the cryptogamic plants which are found in ringworm, sycosis, and alopecia, and much confusion has ensued owing to these discussions. The clinical testimony points to the fact that ringworm of the body and ringworm of the scalp are due to one and the same spore, because it is common to find patients with both on their bodies at the same time, and I have noticed on more than one occasion one segment of the circle on the scalp, and the other on the neck. But hitherto I have not seen sycosis of the head in the same individual with the ringworm of either the body or the head. Neither have I seen alopecia areata in the same subject as the other Tinea. The microscope reveals in all a form of plant life which is not, I grant, contra-distinguished, but I do not care to base my judgment on this investigation alone. The broad lines of demarcation in clinical medicine help us more than the minute details, useful as the latter are. We must use a shovel sometimes, and not always a teaspoon.

Symptoms and Course.

The different appearances presented by ringworm of the scalp are due to the different degrees of inflammation set up in the skin and subcutaneous tissue, by the parasite. Thus in mild cases of the disease, we at first notice round spots as large as a sixpence, which are covered with short, broken hairs, and dirty, chalky-looking scabs. These will spread, and if several occur in the scalp at the same time (which is often the case) they will run together, and form large and irregular patches, which even extend to more than the size of a crown. These patches are always more or less round. At first it is difficult to recognize, as it only consists of a small erythematous patch, and the hairs are not affected; but as the epidermis becomes heaped up, and the hairs present the broken ends, looking like cocoa-nut matting, the disease is easily recognized. There is very slight irritation associated with ringworm. Sometimes, in those who have thin, fair skins, vesicles form around the circumference of the ringworm, but this is not universally the case. In others the inflammation runs into suppurative processes, and then the epidermis is raised, red and tender, whilst pus can be seen oozing out of the follicles. When this degree of inflammation is set up, the condition is known as *kerion,* the suppurative process set up by the parasite, destroys future development, and the disease spontaneously subsides. But in this case it will be found that so severe has been the inflammation that permanent baldness results, and the patient has left depressed, shining patches of baldness, which do not again grow hairs, for the simple reason that the hair papillæ are destroyed. The cure of ringworm by parasiticides strong enough to produce suppurating inflammation is often followed by a like unsatisfactory result. When the patches of ringworm are not inflamed, they are of various colours, agreeing with the complexion of the sufferer. The hairs lack lustre over the diseased patches, and eventually fall out. The disease may grow on any part of the scalp. Generally, they are found over the occipital, not often the parietal bone.

If permitted to run its course, it may go on indefinitely. I have known it to exist for five years. The disease attacks fair children more than dark, is very unusual after the age of puberty, and is scarcely ever seen in the adult. It is seldom met with in infancy. It is liable to attack all classes, rich as well as poor. Upon microscopical examination, the roots of the hair are found to be split up like a horse's tail, and between the hairs are found an innumerable number of spores, which spread into the shaft in wreaths. The broken ended hairs ; the scattered remains of the spores ; the frequent presence of vesication and pustules around it, indicate to moderately careful observation the error which might be made. Where any doubt exists, the microscope will at once decide the question. Ringworm is a highly contagious disease, but it does not travel so far as *favus*, being much heavier.

ALOPECIA AREATA.

Syn. *Area Celsi. Alopecia circumaptis. Porrigo decalvans. Tinea decalvans.*—This disease has been a bone of contention for many years; described by Celsus (lib. VI. c. 49, *De Areis*) under the name of area, and confounded since his time with ringworm, and all other conditions which often cause or leave, as a result of their ravages, bald patches on the scalp. A clear estimate of this very marked malady can only be obtained by observing that, by *Alopecia areata*, we mean a contagious disease, which occurs at all ages, in all sexes, and in all constitutions, preferring the middle aged, commencing suddenly, without warning, and being manifested by the occurrence of round patches of absolute baldness, which patches show a preference for the posterior part of the scalp, but commonly occur on the parietal regions. The hairs around these patches are firmly implanted, and retain their lustre, their colour, and their strength. These patches never spread beyond a certain circumference. They may occur at the same time, may run into each other, and produce extensive baldness.

These patches are not limited to the scalp, but may attack the whiskers, eyebrows, or moustache, but in no case do they occur with anything like true symmetry. The hairs on other parts of the body do not fall out during the attack, neither does the general health suffer. The conditions which have been most often confounded with Alopecia areata have been the remnant of bald patches which are frequently the sequel of *lupus erythematosis* of the scalp; Eczema, or *Tinea Tonsurans*, where suppuration has occurred, or where the disease has been too vigorously treated; or burns, or any other pathological process which destroyed the hair papillæ, and also with the universal alopecia described later, which attacks the whole hair system; which never recovers; and which is a constitutional disease. *Alopecia areata* begins, as a rule, in the head; sometimes several patches occur simultaneously. These patches have always a clear margin; they are smooth, whiter than the surrounding skin, because the hairs are absent, and somewhat depressed below the level of the surrounding scalp. This is very obvious, if the scalp is shaved.

These bald patches are immediately surrounded by hairs, which come out easily, or which fall out spontaneously, until a certain size is reached, when the disease stops. The disease is now obvious. But little irritation is felt, and some patients do not complain of any itching.

When the disease is arrested, as is evidenced by fine hairs growing on the bald patches, other patches do not occur. Sometimes the disease is arrested in one spot and is spreading from another centre, and it must be borne in mind that a patch which has been cured may suddenly be denuded of hair again, but as a general rule, by appropriate treatment, the malady is cured in from 6 to 12 months. From notes of my own taken at St. John's Hospital by Mr. J. H. Gilbert, I find that out of 671 patients, thirteen were the subjects of *alopecia areata*, 3 were females, 10 males. The oldest was 33 years of age, the youngest 6. They were all cured, and the average duration of their treatment was about 7 months. The following case shows the great tendency of the disease to relapse—

L. H., æt. 30, has on right of ligamentum nuchæ, and on the left of the occipital protuberance, circular smooth and absolutely bald patches. She says the first came when 15 years of age, and the hair has grown three times. The parent patch came 8 months ago.

Out of my sixteen cases four of them told distinctly of other instances, and in two of these cases I confirmed their statements by my own observation. The following case is so applicable that I may be permitted to quote it—

G. H., æt. 13. Has had bald patches on head for two years. She has now well marked patches on outer side of the sagittal suture, of *alopecia areata.*

J. H., her brother, æt. 11. Has one patch of emphatically smooth ringworm on the left of the occipital protuberance.

A. H., æt. 15, had a similar patch on the left of her parting, but she is now quite well. They say they believe the disease came from using a strange comb.

Again, P. C., æt. 29. Has two patches of baldness on his skull, which came without warning nine months since, when he was a clerk in a Paris bank. They are now well marked. His fellow clerk, who worked at the same desk as himself, had a similar patch.

I could quote numerous other instances which point conclusively to the infectious nature of the malady from my private note-book, but I have preferred to use three which have been observed by others. The following case was under the care of another medical man as well as myself—

T. A., aged 14. Had a well marked patch of *alopecia areata* over his right parietal bone. This was healed and cured in 8 months in the ordinary manner. But unfortunately his cap was given away, and the boy who wore his cap contracted the disease. Other writers, M. Gillette and others, have also quoted instances in which the clinical facts pointed to the contagious character of the disease. But the following, related by Dr. Hillier, is most conclusive—

" In a large parochial school at Hanwell, " containing from 1,100 to 1,200 children of " both sexes, and from 6 to 14 years of age, a " number of the children were found all at " once to have on their heads patches of bald- " ness quite smooth and pale. The patches "varied in size from that of a fourpenny piece "to an inch or more in diameter. In some "children there was but one spot, in others "two or three. The number of children "affected was 43, *and they were all girls from "seven to fourteen years of age, who lived "together*. There was no case of the kind "amongst the infants or amongst the boys, "*who occupied a separate part of the building*. "On more careful enquiry it was ascertained "that one girl had been suffering from this "disease of the scalp in an aggravated form "for nearly six months, and had been allowed "freely to associate with the others." These cases prove conclusively to my mind that a *A. areata* is a contagious disease, and I never ventured to assert the contrary when I have been asked for an opinion. One instance occurred some years ago which proves how difficult it is to practise and preach always the same doctrine. A boy from a large public school contracted (at least he came before me with) a patch of baldness on the back of his head. I was asked whether the disease was infectious, to which I unhesitatingly replied "Yes," but at the suggestion of others the boy passed before one of the best of our leading dermatologists, who has taught the doctrine of non-contagious *alopecia areata.* He said at once the disease was not infectious, but when asked to certify as to its non-contagious character, he discreetly objected to do so. I saw the young sister of this lad six months after, with the same disease.

The microscopical evidence which we have found at the Hospital has been wasted bulbs, but never of any cryptogamic plant. Dr. McCall Anderson, in his work on skin diseases, gives a beautiful drawing of the spore and bulbs of the parasite found in this disease. And when so accurate an observer, and so trenchant a reasoner, finds the cryptogam, I am contented to attribute my failure in finding it to my own want of skill in microscopical manipulation. The discovery and recognition of the low forms of plant life found in Tinea is one marked by many errors, and fraught with difficulty. It is only successfully accomplished by great patience, care, and practice. But to argue the non-contagious nature of a malady from an inability to discover the contagium verum is a line of argument which would, if applied to syphilis, in the acute specific fevers, abolish their infection entirely.

Arguments have been adduced to prove that *alopecia areata* is due to nerve action, or rather to the aberration of nerve action. Voigl has shown that the loss of hair in advanced age is limited to definite areas in the distribution of certain cutaneous nerves. By section of the sciatic nerve in rabbits, he found that on the part supplied by that nerve hair had not grown four months after he had operated, while in the healthy part the hair growth was normal. Romberg observed that in facial paralysis the hair was shed at the affected part. Von Barensprüng is of opinion that failure of nerve-force is the chief cause of baldness.

Those who have taken refuge in the nerve origin of the malady appear to base their deductions on the belief that the disease is due to suspended innervation of a given area, but this will not account for the long continued relapses of the malady, the numerous points from which it commences, and above all other objections it cannot explain why more than one member of a family are attacked at or about the same time. I would sum up my remarks with the following propositions:—

1st. *Alopecia areata* is a disease which is capable of being transmitted from one person to the other, but not with the same ease as *Tinea tonsurans.*

2nd. That disease is caused by a *contagium verum,* which is most difficult to discover.

3rd. That it is a disease which only attacks those regions which are exposed to the air.

4th. That it is in no way a constitutional disease, *i.e.*, it is not influenced by internal remedies. It does not affect the general health and is not hereditary.

SYCOSIS, MENTAGRA, CHIN-WHELK.

Pliny (*Historia Naturalis*) gives in the first chapter of his twenty-sixth book an account of an unknown disease which, according to his statement was imported by a Roman knight into Italy from Asia. It gave little or no pain, nor was it dangerous to life, but it caused such a deformity that death was preferable (*sine dolore quidam; ac sine* *pernicie vitæ sed tanta foeditate, ut quaecumque mors preferenda esset.*) It was first called by the Greek name '*Lichenas,*' but afterwards *Mentagra,* on account of the chin being the chief seat of the affection. Women, and what certainly is remarkable, the lower orders and the middle classes were not attacked; but the nobles suffered severely, and spread the disease by their habit of kissing each other. Numbers of physicians came from Egypt for the sole purpose of combating the disease, and reaped a rich harvest. The treatment consisted mainly in the application of caustics, which, unless the skin was burnt down to the bone, did not prevent relapses. The description given by Pliny of its ravages and of its epidemic character is probably much exaggerated; but he mentions one characteristic of the affection which is even now peculiar to some of its forms, namely, its obstinacy and its liability to return unless radically cured.

Ælius Amidenus, a physician of the fifth century, relates in his "Tetrabiblos" that one Pamphilus treated at Rome the mentagra described by Pliny by a blistering ointment, consisting of oxide of copper, orpiment, hellebore, and cantharides; in fact, by a very powerful depilatory ointment.

Celsus gives in the sixth book of his "Treatise on Medicine" a pretty fair description of this disease. There is an ulcer, he says, which the Greeks call *sycosis*, because of its resemblance to a fig (the inner part of a ripe fig is probably meant), and he goes on to describe it with considerable minuteness. The first form (*durum et rotundum*), he says, is limited to the beard, and is probably true *sycosis;* but the other variety which, he says, attacks the scalp, is moist, and discharges freely offensive matter, is probably not a *sycosis*, but what we know as contagious *porrigo*. This species of *tinea* called *sycosis*, or *mentagra*, is a disease of the beard, moustache and whiskers; being most frequently found upon the skin, rarely affecting the scalp. It is characterized by spots or erythematous inflammation, involving the hair follicles, which patches frequently suppurate and give rise to considerable induration; and in some patients surrounding eczema is set up by the irritating influence of the discharge. The hairs which are attacked are easily extracted, and the bulbs will be found shrivelled. There is seldom any difficulty, even with a low power, in demonstrating the presence of the microsporon, especially those wherein suppuration has not taken place. As the eruption increases the hair follicles become more involved, and many of them obliterated, so that, if the disease be not checked, permanent bald patches may be left. The rapidity with which this disease advances is in some cases surprising. It is not uncommon to find a patient who has a susceptible skin much irritated by a discharge from a catarrhal state of the nasal mucous membrane about his nostrils; and I have notes of three cases, where in about twelve days a true *sycosis* has existed. There is another variety of the malady, which is found amongst men engaged in shoeing or grooming horses. These animals are subject to a malady known as the "Grease," which in reality is a parasitic disease attacking the heels of horses; and I have in my possession the portrait of a man who cut his lip while shaving, and who almost directly afterwards shod a horse affected with this malady. In three days he consulted me, with a condition of his chin and beard in all respects like *sycosis*, and the hair follicles were invaded by the cryptogams. I may say this man got rapidly well, under the treatment for *sycosis.*

Although we have enumerated *sycosis* among parasitic affections, we are bound to state that some of the principal dermatologists, both in this country and on the continent, such as Wilson, Hebra, Barensprüng, and others, doubt the existence of a *sycosis* parasite. Hebra looks upon the disease as a local inflammation, having its seat in the hair follicles, whose origin, he adds, is altogether unknown to him, and dermatologists have been challenged to prove its cryptogamic origin by demonstration before a pathological society.

The challenge was accepted by McCall Anderson who, at a meeting of the Medico-Chirurgical Society of Glasgow, held in January, 1868, demonstrated without a doubt that the disease was associated with a fungous growth attacking the hair follicles. The fact seems that, as regards its cause, there may be a parasitic variety and a non-parasitic; so that *tinea sycosis* should, as Tilbury Fox suggested, be confined to the parasitic variety as contradistinguished from *sycosis.* And probably these cases, which one so often meets with, which baffle all our treatment, are not parasitic, but due to some directive agency governing the individual, such as scrofula or syphilis.

ALOPECIA SOMATICA.

The hair of the head is frequently shed in all the acute exanthemata, notably scarlet fever and small-pox. In these cases the alopecia occurs all over the scalp. The hairs seem to lose their hold of their follicles and drop out. Sometimes, but very seldom, the eyebrows and other hairy portions of the body are denuded. During the course of consumption, the hairs always get much thinner, and become long, straggling, and lie close to the head. This gives the very curiously white look which the scalp has in all wasting diseases, and which the laity recognize as a fatal omen. We need not be in the least anxious about these cases of loss of hair. The hairs fall out because the blood is of an unhealthy character; so soon as the normal state is restored the hairs will grow again, as luxuriantly as ever, but sometimes of an altered colour.

The cases on which we are often consulted, of young ladies who complain that their hair comes out in handfuls, are associated with the following train of symptoms:—The patients tell their story, as a rule, with much confusion and tremour. Their pulse will be found to be beating rapidly. They are those who eat but little meat, scarcely take any exercise in the fresh air, and are always lazy, fretful, and weary. They suffer most from cold feet, back-ache, flatulence, and head-ache. Their bowels and menstruation are disturbed, and they form the great bulk of patients which frequent the rooms of the consultant. They are always anæmic, *i.e.*, their gums are pale, and they have many and varied manifestations of an erratic and wilful nervous system.

I do not include those cases of loss of hair which occur in women between forty and fifty in this group.

If we can gain the confidence of these patients, if we can prevail on them to go to bed early, to sleep eight hours only out of the twenty-four, to take an interest in life, to use their muscular frame by plenty of exercise in the open air, to eat a plain meat diet, to drink some beer with their meals, to avoid pastry, pickles and sweets, much craved after by them, we shall scarcely ever need the action of the old pill of two grains of carbonate of potass, and two grains of granulated sulphate of iron; but it will help us much, if we order a stimulating pomade for the scalp, such as are given at the end of the book.

Syphilitic Alopecia.

The hair is often shed to a slight extent in syphilis. It occurs as a rule about the eighth month, and varies much in degree. Out of seventy patients labouring under this disease, I find fifty-nine had more or less loss of hair, and it has supervened from the third to the ninth month in my cases. Syphilitic alopecia commences generally on the vertex of the head, which is denuded often very rapidly. It may then affect the whole scalp. The hairs lose their gloss, become dry, discoloured, and are easily combed out. True syphilitic alopecia need not be accompanied by local phenomena of eruption or desquamation, as it evidently depends on a special modification of the general economy. It is rarely general, mostly being limited to the summit and anterior part of the head. The loss does, however, in some cases extend to the eyebrows and the beard. This kind of alopecia is mostly transient; the hair grows again after the syphilis has been combated by a rational treatment.

In the usual course of the disease the patient does not complain of the symptoms, and it is scarcely perceptible. In other instances there is almost complete denudation of the scalp. Wherein this occurs, my notes seem to show it is associated with a good deal of indiscretion and much deterioration of the general health. A lady has just died under my own care, with the following painful history:—She was divorced from her husband because of alcoholic excess and infidelity on her part. She contracted syphilis in December, 1882. She came under my observation with acute pneumonia in July, 1883. She had then absolute baldness, excepting a few very straggling hairs. The eyebrows were shed, and many of the eyelashes, but the pubic and axillary hairs were intact. She had mucous tubercle in the buccal mucous membrane and the tonsils. The glandular system was universally enlarged. She had been suffering from delirium tremens before her seizure.

The lung became gangrenous, and she died fourteen days after the commencement of the pneumonia. How much the syphilis contributed to the pneumonia it is not possible to say. I would only like to draw attention to the association of alcoholic excess, syphilis, and alopecia. I have frequently found those who have drank heavily become bald early. The form of alopecia which occurs during the course of syphilis is not permanent, and must be met by appropriate constitutional treatment.

Alopecia Follicularis.

Those cases of loss of hair, which occur in patients who have some other disease of the scalp, are indicated in this group. The most common form of this disease is what is known as *seborrhœa capillata*, or by the laity " dandriff," or " scurf." It is not a condition which occurs before the age of puberty. At first the patients complain of a good deal of itching of the scalp, which itching is worse when the head is hot; as after dancing or other violent exercise. "It prickles," the patient tells us. On examination of the skin on the head, especially at the summit of the crown, the head here is covered with a large quantity of scales, which in cleanly people are white, but in the dirty these scales become yellow. They are easily detached by scratching, and even fall off without friction. The collar of the coat will sometimes be almost covered by these scales of dead epithelium. The scalp beneath these scales is of an intensified colour, but it is not weeping, as we see in *eczema capitis*. These scales sometimes accumulate and form a thick covering to a portion of the skull, which in one instance may crumble like chalk, and in others contains more fatty matter, and mats the hairs together with a paste feeling greasy and looking like putty. This state is always associated with some loss of hair. But the milder condition may and does go on for many years without causing any anxiety until the hair begins to fall, as it always does in the course of time, and you now have added to the seborrhæa *Defluvium capillorum*, a falling off of hair and later baldness. The patients notice the loss of hair at first very gradually, and it is only when well established that advice is sought.

The baldness is never sharp and sudden, as we find occurs in *Alopecia areata*, but it is gradual, and the hair follicles produce for a long time downy hairs. In all instances the effect of the unhealthy state of the scalp is very obvious, because the hairs which grow in these regions where the disease is not, are strong, firm, and well planted.

This form of loss of hair is generally remedial, especially where the patients apply before the hairs are all shed. The treatment will be discussed in the chapter devoted to Therapeutics. The hair is often lost from *eczema*, *psoriasis*, *impetigo*, and as has been mentioned, from *Lupus erythematosis*; and in many instances irremediably lost. The process of denudation always occurs by the disease interfering with the nutrition of the hair root, by exercising pressure, but in none of these diseases is the baldness sudden.

There is often great difficulty in differentiating *seborrhœa*, *psoriasis* of the scalp, *eczema*, *impetigo*, and *porrigo*.

But if we remember that *psoriasis* occurs in well-defined patches, is not universal, and is always associated with the disease elsewhere, we have no difficulty. If we remember that *eczema* attacks a large area, is associated at some period of its career with oozing, and with itching and enlargement of lymphatic glands; and that *impetigo* is never contagious; *porrigo* of the scalp is a disease of childhood, and is associated with a large amount of pus and epithelial accumulation, and that there are other portions of the skin affected, we shall avoid errors either in prognosis, diagnosis, or treatment.

ALOPECIA UNIVERSALIS.

All writers on *alopecia areata* have described an advanced stage of the disease which seldom occurs, and in which instance, not only the hair of the head and whiskers are attacked, but the covered portions of the body. Thus Dr. Carson records in the Edinburgh Medical Journal, vol. 5, a remarkable case of complete depilation. The patient, aged thirty-five, tall and muscular, and apparently free from any constitutional disease, noticed one day on shaving, a bare spot on the right cheek. On going to have his hair cut the same day, the hair-dresser called his attention to a circular bare spot on his occiput. From this day the respective bald spots enlarged, until he had not a hair left on his head, on his face, or on any other part of his body. During the progress of depilation the patient felt neither pain nor any inconvenience. The series of cases published by Mr. Hutchinson in the British Medical Journal for 1858, contain instances where the baldness has spread to other regions than the face or scalp, notably No. 26, where the eyelids, lashes, beard, and anus were affected.

The late Mr. Startin alludes to similar instances in his lectures given in the year 1846.

Kaposi relates an instance of universal loss of hair in the case of a physician from Gallicia, who shed the hairs of his head, eyebrows, eyelashes, beard, axillæ, and pubis. Other reference of allusion might be made from the works of dermatologists, but no useful purpose would be attained.

I was fortunate enough to exhibit the following most interesting case at the Pathological Society in 1882:—

George Booker, aged 26, a carter from Sevenoaks, came to St. John's Hospital on February 10th, 1881. He is a strong, very muscular, and cheerful man. His father and mother are both living. The father had a patch of scurvy on his right leg which used to itch very much (probably *eczema*), and his nails used to break off. Otherwise he was and is a very healthy man. He has brothers and sisters who, so far as he knows, are well and free from any skin disease. He gives us the following story—"Five years ago my "baldness began in one patch in the middle "of the back of my skull. Then others came "on my head, and after these I got some white "hairs and bald places on my eyebrows and "whiskers. My sisters used to say I looked "as if some one had thrown snow at me. "These bald patches have gone on increasing "until I am as you now see me. I am strong "and well. I don't itch or feel cold. I have "never had syphilis or a day's illness in my "life that I can remember." On stripping him he appeared on casual observation to be absolutely bald, but on close inspection of the scalp, perfectly symmetrical patches of smooth and absolute baldness were found, which had convex margins, and beyond these convex margins were a few fine straggling hairs. There are a few straggling hairs on his upper lip. There is not a single eyelash left ; on the external aspects of his arms and legs the hairs are fast disappearing, and they are disappearing in a regular symmetrical manner from centres which are readily seen and which have abruptly defined margins. He has not more than a dozen hairs on his pubis or in the axillæ. In some situations, notably at the corners of his mouth, and between the scrotum and thighs, the bald and convex patches are not only devoid of hairs but also of pigment, the patches standing out in bold relief, and being of a dead white, like those which we see in Leucoderma. He has no other evidence of skin disease, neither of having had syphilis. I have seen the patient every month until the present time, August, 1883, and I cannot discover any further effort at the growth of hair. He continues in good health.

The case I now quote also occurred in my hospital practice. William Morgan, aged 22, a telegraphist from Mile End, has, on the centre of each eyebrow, a patch of absolute baldness. The hairs have also disappeared from the centre of his moustache, and there are two symmetrical patches of baldness on either side of his chin. The lines of demarcation are very distinct. The patches itched a good deal when they first came. The pubic hairs are falling out, but not from any perceptible centre. On the 17th November I made the following note:—" On the extensor " surface of the left arm is a well defined " patch of baldness. The right arm is not " influenced. On the front of both thighs are " true patches which are nearly devoid of hair, " and on the anterior part of the hip are two " absolutely bald patches. The hair of the " head falls out a good deal. There is one " bald patch just above the occiput, the size " of a shilling. He has some symmetrical " grey patches on his whiskers. There is no "history of family skin affection." Four other cases have come under my own observation during the last four years. Three have been women, and one man. The noticeable peculiarities in my patients were :—

The symmetrical progress of the malady.

The loss of pigment, as well as loss of hair, on some of the invaded patches.

The incurable nature of the condition.

I examined carefully the hairs in all my cases, but failed to discover any spores or mycelium.

Skin diseases, which advance in a symmetrical manner, are not due to parasitic causes or the affection of nerves. Those cases which I have ventured to distinguish from *alopecia areata* are in no way related to it. I look upon it as constitutional, as much as I should psoriasis or leucoderma. In fact, I should argue that there is a very intimate connection between this condition and *leucoderma*, for in *leucoderma* we find the same symmetrical progression, the convex edges of the patches, the freedom from failing health, and the incurable nature of the malady.

I cannot help believing that these cases are much more common than is believed, or they have not often been described; probably those who suffer are anxious to hide their hairless state, and do not seek advice.

For the same reason, I have often discovered bald portions of skin, when examining patients for other conditions. Such bald patches are especially found on the outer aspects of the limbs of those who have most friction of the clothes upon the skin; and it has appeared to me in some cases of prurigo, where the patients scratch themselves unmercifully, on the thighs especially, that the itching has been caused by the hairs being prevented from making their exit out of the mouths of the follicle, by the pressure and friction of the clothes. If we examine these patients in a good light, we shall often discover rounded hard bodies, which feel like shot. These can be dug out easily, and when examined attentively, will be found to contain an imprisoned hair, curled up like a watch spring inside its follicle. I have under my care at the present time a street musician, who by a very ingenious contrivance is able to play upon several instruments at the same time; and in the movements which are necessary for him to accomplish his pandemoniary feat, he is exposed to much rubbing of the outer portions of his thighs and arms, and in these localities he has violent itching. The hairs here are all rubbed off short, and without any lens, the curled up hairs are easily discerned.

This form of *prurigo* is much worse in cold weather, and closely agrees with the disease which was described simultaneously by Mr. Hutchinson and Professor Duhring.

Chapter V.

CANITIES, PILIOSIS, GREYNESS OR HOARINESS OF THE HAIR.

THE loss of the colour of the hair is due either to advanced age—the physiological cause, or disease, or in some instances it may be caused by strong mental emotions, or it is an inherited tendency. The time of the appearance of that unwelcome visitor, the first grey hair, depends upon numerous circumstances. In most cases, the grey hairs make their appearance singly, and the bleaching is first noticed at the root. Those who are becoming grey always show their greyness more after being cropped, because the black ends being cut off, the grey roots at once stand out more clearly defined. This is very apparent in horses, after they have been clipped or singed during the winter months.

There is no doubt that fat is the chief cause of the colour of the hair. This fat is equally distributed upon the cortex of the hair; alkaline substances dissolve the grease and discolour the hair. This is why strong potash waters make the hair light coloured; and this is why fatty substances, such as oil or pomatum, render it a little more coloured. The presence of air has been clearly demonstrated in the hair by Kölliker. Dark hair contains very little air; light hair a good deal.

ETIOLOGY OF CANITIES.

We have seen that, according to the prevalent opinion of anatomists and physiologists, the blanching of the hair is chiefly due to the disappearance of the dark pigment, which is formed and carried into the hair from the papilla at the bottom of the hair sac. Pfäff entirely dissents from this opinion, however plausible it may appear. He found, on examining many white human hairs under the microscope, the medullary substance well filled with dark pigment cells. But how, it may be asked, can a hair filled with dark pigment cells look white? Simply because the cortical substance of the hair is so dense that the pigment cells do not show as before. In flaxen, light coloured hair, the light passes through the cortical substance; in white hair the cortical substance reflects the light. So that it is this cortical substance which has undergone a change, as it now reflects the light, like thick frosted glass, whilst formerly, when the hair appeared of a darker colour, the light was allowed to pass. The pigment often disappears entirely in very advanced age, but in the grey hairs of young persons the pigment of the medullary substance will be found in many instances to be unchanged. But just as these are grey in perfectly white hairs, with dark pigment cells, so there are dark hairs without any pigment cells whatever. On examining red hairs closely, it will be found that on the epithelial layer being scraped off, the cortical substance shews a reddish tint. For this reason there are perfectly red hairs entirely wanting red pigment in the medullary substance. Brown hair consists in every part of a light brown horny mass; black hair of a faint yellow horny mass; and only white hair shews, with the exception of the medullary substance, a perfect colourlessness of the horny substance.

We can easily ascertain the correctness of the observation which runs counter to that contained in nearly all the manuals of physiology with reference to the colourlessness of the epithelial layer and the horny fibres of the cortical substance of the hair, by bleaching a human hair in chlorine gas. Chlorine soon deprives the epithelial layer and the cortical substance of its colour, and the brown pigment in the medullary substance remains unaltered. Nevertheless, after a short action of the chlorine, the hair appears of a bright yellow, and after a longer action quite white; but the chlorine has only taken up the colour of the horny mass of the epithelial layer, and of the cortical substance. Among the remote causes of greyness must be first mentioned heredity. Numerous instances of this kind are cited by ancient authors. One writes "Greyness is a sign of gentle blood." It is, moreover, asserted that children of aged parents become sooner grey. Tarquin was born with grey hair. Seneca is asserted to have received his name from the same circumstance. It was formerly believed that such as become grey in early age die a premature death. Daily experience shows that there is no foundation for such a belief. I know of a family, all of whom became grey at twenty-one, but they have all lived to an advanced life. Voigl, Zeiler and Plenk quote similar instances. Even trifling peculiarities in the disposition of the hair re-appear in descendants. Mr. Hutchinson told me of a similar instance, and I have in my note-book several cases, all of which have been inherited: all have been in locks. The hoariness of the aged usually begins at the temple, whence it gradually spreads to the whole of the hair. The colouring matter is no longer provided in the same quantity, or is wholly withheld. Greyness in tufts is often noticed in the head and beard owing to some local affection of the skin. Hairs which grow on scars are usually white. The greyness of the hair is normally a very slow process. The grey hairs are at first very few, but gradually they multiply. In the great majority of cases men do not become grey before they are forty. Women retain the colour of theirs to a later period. The nervous influence upon the hair, whether as regards baldness or greyness, is abundantly proved. Dr. Anstie (Reynolds' "System of Medicine") writes that after an attack of facial neuralgia he noticed that the hair of the eyebrow was whitened, and that grey hair was thickly strewn over the right side of the head for some time after the attack. Sir James Paget tells us in his lectures on Surgical Pathology, p. 31, "No "tissue, indeed, seems to be wholly exempt from the influence of the nervous "force on its nutrition. In the cuticle it is "manifest; and for its influence in acting, "even through a considerable distance, I "may mention a case which is also in near "relation to those in which the hair grows "quickly grey in mental anguish. A lady, "who is subject to attacks of what are called "nervous head-aches, finds, in the morning "after such an one, that some patches of her "hair are white as if powdered with starch. "The change is effected in a night, and in a "few days after the hairs gradually regain "their dark colour." This extract leads us to the discussion of sudden blanching of the hair. Sir Thomas More is said to have become grey in a single night after being condemned to death. Lemnius relates the case of a young man whose hair and beard became grey in a single night after being sentenced to death, and who was so altered in appearance that no one could believe that he was the same person, for which reason the emperor pardoned him. Thomas Campanella saw a monk at Rome named Ubipertus, who had been elected bishop of Ratzeburg, but he was too young for the office. He went to Rome to obtain a dispensation from the Pope, but being refused, became quite grey during the following night, so that the Pope could not recognize him at first, but gave him the dispensation, saying, "*Quem evidenti signa Deus probasset!* —God had proved him by an evident sign." Shipwrecked persons have sometimes become grey in a short time, from fright. Henry IV. is said to have become grey within 24 hours about the time of St. Bartholomew's night. The story of Marie Antoinette is well known. The cases are so numerous of care and anxiety giving rise to grey hair that it has become proverbial.

Cura facit canos
Quamvis homo non habet annos.—

Although a man be not in years,
Grey hair on his head soon appears.

Dr. G. Vogel says of himself that when he lost his beloved wife he became grey in a single night, in his thirtieth year. We all remember Shakespeare's saying, "Worcester is stolen away to-night; thy father's beard is turned white with the news."—*Henry IV.*, 2nd scene, iv. I have seen a man suffering from delirium tremens whose hair turned grey after a violent fit of passion lasting several hours. It is not only the hair which is influenced so much by the nervous system. The blanching of the skin and blushing during anger are parallel processes. Young children become incontinent frequently when frightened. Dogs pass urine frequently when thrashed. The secretion of the liver appears to be much under the influence of the emotions. One of the prisons in London caught fire some years ago, and it was doubtful whether the outer wall would not tumble down. The fear of this had such an influence upon three of the warders that they became distinctly jaundiced a short time afterwards. Numerous theories have been advanced to account for the rapid turning grey of the hair during violent emotion. It has been argued that the acidity of the sweat blanches the hair, but it would appear to me more probable that the whitening is induced by the action of the muscular fibres of the hair and sebaceous follicles. But the *modus operandi* has yet to be explained. We know that the condition of the nervous system influences the glands and their secretions. We know that there is a connection between the secretion of the sebaceous glands and the colour of the skin. Is it, then, too much to say that the venous disturbance arrests the secretion of the fatty matter? Haller, as is well known, questioned the truth of all cases of sudden greyness; but Bishop says that he has himself seen six, if not more, such cases. Fright, we know well, causes the hair to stand upright, and painters have been wont to depict standing hair in order to express terror.

Chapter VI.

CRINAL ABNORMITIES.

Plica Polonica and some other affections of the Hair.

THIS disease of the hair, or rather, as we believe, of the skin, is at present confined to so comparatively small a territory, that it is not surprising that it is so little known. It has many names on the continent but none in English (unless we call it "elf locks"), which shows that this affection was known in Shakespeare's time (Romeo and Juliet). The hairs of the patient are matted and glued together by a quantity of secretion from some obvious disease of the scalp, such as eczema; and when the secretion is allowed to accumulate, it becomes the habitation of lice and various forms of vegetable life, so that it is not a disease *sui generis.* It is often endemic in Poland, Russia, and Hungary, but has seldom been described by English writers. We sometimes see in this country a disease of matted hair, called by the French *tentrage, i. e.* felted hair. In this state the hairs become so matted by negligence that they can scarcely be separated by combing. In fact, when this condition is met with, the quickest mode of bringing the hair to its normal state is to have the scalp shorn, when, with proper care, the new hair will be normal, as the bulbs are not affected.

AFFECTIONS OF THE TEXTURE OF THE HAIR

Are both varied and numerous. They are found often upon the cortex, or in the medulla, or in both. The bulb of the cortex becomes separate, and the hair becomes bifid or forms knots from distance to distance. When this occurs the disease is called *Trichinexis nodosa.* Dr. McCall Anderson described a well marked instance in the Lancet for July, 1883, which attacked several members of the same family. Sometimes these bulbs separate from the shaft and split, when they form the *scissura pilorum* of the ancients.

SPLITTING OF THE HAIRS.

(Fissura capillorum). This is a morbid condition in which the human hair resembles, in one respect, a pig's bristles, which as a rule are split at the point, but they may be so at the centre of the shaft, in very long hairs. There are often found in this state hairs with several branches; such splittings are frequently noticed in violent headache, gout, rickets, and also in acute fevers. When the hairs once begin to split, they generally fall out. The best thing to be done in such cases is to tip the split hair at the point. The general condition of the patient must be carefully attended to, otherwise no strengthening liniment or pomatum will be of any use. But where there exists a general disposition in the hair to split, it is best to cut it short for a year at least, having it pointed every two months.

FEATHER DISEASE OR PHAGMESIS OF THE HAIR.

There are a few instances recorded of reproduction of feathers instead of hairs in man. At Maccomp, in the county of Cork, a couple of black rabbits have been exhibited with feathers instead of hair. In 1831 there was exhibited at Bremen a boy, whose head was covered with feathers instead of hair. The case is recorded in Baüerle's magazine for 1831.

RINGED HAIRS.

Sir Erasmus Wilson has reported some cases of ringed hair, *i.e.*, hairs which have a black ring, and then one white throughout the texture of the hair. The following case, which came under my own notice, demonstrates the possibility of the occurrence. J. Casper, a young man aged 20, consulted me for grey hairs. On looking carefully at the hairs by transmitted light, distinct, well-defined rings could be seen throughout the entire length of some, but not all the hairs of the scalp. He had been a very delicate boy, and suffered many illnesses. His scalp was supple, moist, and healthy, and the hairs were fairly implanted. He had on his nails a series of transverse white lines which occupied all the nails in his hands, exactly in the same way as those described by Dr. Wilks and

Dr. Langdon Down. In other respects he did not present any disease. I am quite prepared to admit that no rational explanation has occurred to my mind which will account for the condition. The series of illnesses which he had passed through, may so have influenced the disposition of pigment that the rings would in some way be found to be conditions of ill health which had preceded this state. I unfortunately lost sight of my patient, but I was inclined to believe that as age advanced, and if his health improved, the ringed appearance would cease.

COSMETICS.

In the previous edition of this work I did not treat of this subject, believing that it is not the province of physicians to lend themselves to those who would often abolish the greyness which add so much to the dignity and beauty of old age. Since this date, however, I have seen so many damaged scalps and hairs through using the numerous dyes, &c., &c., that I have endeavoured to treat the subject so as to warn those who are desirous of abolishing the natural attributes of old age. No doubt the wish to enjoy perpetual youth and the desire to improve and beautify the surface of the body are not only the most predominant, but pardonable ideas in mankind. Cosmetics formed among the ancients a branch, and whole volumes might be filled with the mere titles of the treatises published by the Greeks and Romans, but especially by the court physicians, on cosmetics. The progress of chemistry has much simplified the subject, and has enlightened us as regards the dangers of making up the recommended preparations. As a general rule all such preparations as contain metallic oxides or mineral acids should be viewed with suspicion. Every cosmetic which is kept a secret, in whatever form it may be manufactured, will in most cases be found fraudulently inert, yet injurious to the general health. Let no one imagine that it is possible to improve the skin permanently without attending to the purity of the liquids which circulate throughout it. There subsists an intimate relation between our internal and external organs, so that uterine affections are mostly indicated by external manifestations. One of the earliest authors who has treated of cosmetics was Crito, a Greek physician of the time of Trajan. His work, which included *cosmetics*, consisted of four books. Excepting what are gathered from the writings of Galen and Celsus, little has reached us of his work. A recipe is ascribed to this author, by means of which Helena is said to have acquired that dangerous beauty which led to the destruction of Troy, at which time she must have been an elderly lady. The recipe consisted of the yolk of an egg and gum benzoin, which when applied would certainly render the skin smooth.

HAIR DRESSERS AND BARBERS OF THE ANCIENTS.

The business of hair dressers and barbers amongst the ancients was a far more important one than amongst us, since they never had generally either combs or proper knives in their hands. They were thus compelled to pass their early hours in the barber's establishments (*tonsilites*) which were most frequently filled with idlers and gossips. Rich people certainly possessed the necessary implements and kept slaves for the purposes of the toilette. The *tonsor*, or, as in vulgar language he was called the *barbatorius*, usually asked "How do you have your hair cut?" For there were at least five modes of doing so. They generally used only one knife, sometimes two, which were disposed so as to form scissors. These tonsors also cut the nails, hence the *ad unguam factus homo* of Horace.

HAIR COSMETICS.

Under this head are included all such preparations as are used for restoring the hair when lost, and for preserving and beautifying it, as well as the compounds for use and for restoring the hair, dyeing it, and removing superfluous hairs.

DEPILATORIES.

Advertisements for restoring the hair which has fallen off. The impudence of the advertisers is only matched by the credulity of the dupes. The best of their nostrums are those which contain nothing deleterious, and which are little more than the ordinary fats and oils coloured and scented. The art of hair dyeing and the embellishment of the hair was cultivated largely by the ancient Romans. Pliny cites a vast number for darkening the hair. They used goose fat, St. John's wort, myrtle, some of the peel of onions, &c. To prevent the hair turning grey, they used a liniment composed of the ashes of earth worms and oil, and bears' grease. The satirists did not fail to castigate the depraved habits of their time to conceal the ravages of years. Thus Tibullus, lib i., eleg. viii., v. 43, has it—

" Coma tum mutatur, ut annos
" Dissimulet ; viridi cortice tincta nucis."

" You hide your age by dyeing the hair with
" the green rind of the walnut."

The women dyed their hair and eyebrows. This dyeing of the hair sometimes brought its just reward. Thus we are told by Suidas, L. 3, 43, that Philip, the father of Alexander, observing that one of his friends, named Antipater, whom he had appointed one of the chief magistrates, dyed his hair and his beard, removed him from office, saying, that a man who is not sincere about his hair was unworthy of being trusted in what he had to do.

"Dicens, in capillis infidum, in rebus agendis "fide dignum esse ne puta."

Soap was sometimes used by the Gauls for producing a reddish hair. Hair dyeing, although in bye-gone days a branch of the medical art, is now entirely in the hands of the perfumer and hair dresser, and it is remarkable how little attention English practitioners pay to hair affections. Very recently a surgeon applied to me for a hair dye which would not damage the hair in any way. It is only fair to state that this dye was required for a patient, and not for himself. He sent me at the same time a bottle which contained nitrate of silver, and another wherein was made up a solution of lead, two powerful remedies, and both certainly capable of damaging the hairs and scalp, and also of producing metallic poisoning. There are, unfortunately, many dangerous dyes on sale. Most of them, however, no matter how romantically called, are simply so many solutions of lead, mercury, silver, or copper, combined with a decomposing agent. Some of the hair restorers contain as much as a drachm of acetate of lead in half a pint of water. Of a more complicated nature, but equally injurious, are sulphur and iron, or sulphur and lead. Iron and sulphur have also been used alternately. There is a remedy in repute amongst hair dyes, whose action can certainly be checked, and with which the hair can be coloured in different shades. It consists of two separate solutions, one containing nitrate of silver, the other containing a solution of potassium. The solutions are applied to the hair consecutively, reaction obviously depending on the combination of the silver and sulphur. These remedies require the most accurate chemical knowledge; otherwise strange results may be obtained, such as green hair. The natural antagonism which has always existed in the profession against the use of metallic hair dyes has caused a good deal of attention to be given to the discovery of a vegetable and non-injurious dye. Dr. Pollack, a court physician in Persia, introduced a vegetable hair-dye which is much used by the Russians to produce a dark blue colour, which is much prized by them. The remedy consists of the dried henna plant and of powdered indigo. These powders are, of course, entirely applied to the scalp, and it does not appear that they will damage either the hair or scalp. But so much dexterity is required that most undesirable results are obtained by those who are not skilled in their use. The hair owes its property of being dyeable to its porosity, which seems greater than its structure would lead us to infer. Sulphur being one of its constituents, renders it liable to be darkened when combined with some mineral substance, such, for example, as lead and mercury. The depth of the shade of colour will, in many cases, depend upon the quantity of sulphur present in the hair. Thus, as red hair contains more sulphur than dark hair, the effect will be greater. Dr. McCall Anderson considers a lotion of hyposulphite of soda the most perfect hair dye. A few applications rendered the hair of the part which was before bright red nearly jet black, while neither the skin nor the clothing were stained. The red hair, as it grows, possesses of course the normal tint. The reason of the escape of the epidermis while the hair is dyed is that it contains no sulphur. The "golden yellow" colour, so much in fashion some years ago, is produced by a solution of arsenic with a mordant of hydrosulphate of ammonia.

There are many instances on record of poisoning by cosmetics of a deleterious nature. Thus Horace Walpole (Letters, v. iii.) writes: "That pretty young woman, Lady Fortune, is at the point of death, like Coventry, and others, killed by white lead."

Dr. George Johnson treated at King's College Hospital some *ballet* dancers suffering from lead poisoning by the use of *flake white.* John Hunter gives the case of a gentleman who exhibited symptoms of lead poisoning from using a hair restorer to dye his grey hairs. The wash, when analysed, proved to contain nearly three grains of lead in the form of acetate to the fluid ounce. Dr. A. S. Taylor ("Principles of Medical Jurisprudence") mentions a case of paralysis of the muscles of the neck from the use of a hair dye containing litharge.

I have myself seen two well marked cases of colic, combined with a blue line on the gums, one in the case of a vain old *roué*, who had for many years used a hair dye, which contained acetate of lead; the other instance was in a patient who had dyed his moustache only.

It really comes to this, that all the dyes which have a mineral basis are not only injurious to the hair but also to the scalp and the whole organism, and that all the vegetable extracts damage the hair. This I say with the fullest knowledge of the contrary statements made by the manufacturers of the many dyes; and as I said at the commencement of the chapter, I only enter into this subject to show the injurious effects which sometimes follow in the train of despotic fashion. When these ill effects are so clearly visible, it is the duty of the medical profession to expose their ill results.

CHAPTER VII.

TREATMENT.

I HAVE avoided any reference to treatment while discussing the different forms of baldness, believing it would be better to take each variety separately, and endeavour by a rational therapeusis to place before my readers the plans which have been adopted for restoring the hair. The only way of accomplishing this is to discriminate the varieties of the condition, and taking the indications for treatment from the pathological state, endeavour in each instance to combat the cause. I am conscious that many of my formulæ are complicated and old fashioned ; but I am convinced that the more agreeable we make the preparations which have to be applied to the surface of the body, the more will our patients be pleased to apply them, and the greater will be our success.

The form of baldness which we find occurring in young ladies at the spring and autumn of the year will be found associated with a feeble condition of the organism, as will be indicated by the pallor of the gums and general feebleness, with cold hands and feet. These patients usually require some preparation of iron, and I have never had the same success with any other form as with the pills made according to the following formula :—

℞ Ferr. Sulphat. Granulata
Potassæ Carbonatis aa ʒ ii.
Tragacanth cum Glycerini q. s.
Fiat massæ et divis. in pilul., no. xlviii.

I direct my patients to take three of these pills three times a day for the first week, then to diminish the dose to two three times a day for the second week, and afterwards to keep taking one three times a day until the general health is improved. I advise them to have the hair tipped once a month ; not to use a machine brush ; and to spend a great deal of time in the fresh air, without any head gear ; to partake of a generous meat diet, with a fair amount of fat, and where it is possible, to drink a pint of malt liquor daily, or some red wine. If this does not interfere with the digestion of food, I believe good arises from it. I advise them to rub well into the scalp the following washes, first the alkaline for a week, afterwards the acid. The rubbing can only be accomplished by another person, who must be directed to use a piece of flannel or sponge :—

Alkaline Hair Wash.

℞	Boracis	ʒ i.
	Glycerini	ʒ ii.
	Tinct. Cantharidi	ʒ vi.
	Liq. Ammon. B.P.	℥ i.
	Ol. Lauro-Nobilis Essent	♏ iv.
	Aquæ ad	℥ vi.

Misce.

Acid Hair Wash.

℞	Acet. Aromatici	ʒ ii.
	Glycerini	ʒ ij.
	Sp. Vini. Rect.	℥ i.
	Liq. Epispastici	ʒ i.
	Aquæ Flor. Aurantii	℥ ii.
	,, Rosæ	ad ℥ vi.

Misce.

I am indebted to Mr. Wilson, of Lamb's Conduit Street, for the combination of each of these washes.

Precisely the same treatment is applicable to the premature baldness which occurs in men who are out of health. But where the baldness is associated with another malady, such as syphilis, then appropriate constitutional treatment must be introduced.

Where there is an accumulation of dead epithelium on the scalp, this must be removed by a shampooing liquid. The following formula, made by Wilson, is an elegant and useful preparation :—

℞	Sapo animalis, B.P.	℥ ss.
	Aq. Coloniæ	ʒ viij.
	Liq. Ammon. B.P.	ʒ viii.
	Aquæ destill.	ad ℥ x.

About a wine-glassful of this is to be used twice a week; and the following morning the undermentioned pomatum is to be rubbed into the scalp :—

℞	Medullæ Purificati Bovis	℥ grs.
	Ceræ alb.	ʒ gr.
	Balsam Peruv.	ʒ gr.
	Liq. Epispastici	ʒ gr.
	Ol. Rosmarini	♏. iv.
	Ol. Rosæ Essen.	♏. ij.

Melt the marrow and wax together; then strain, and when nearly cold add the Peruvian balsam to the other ingredients. I believe the falling off of the hair in the aged has been retarded by this treatment, which will be found to make the scalp soft and healthy.

The cure of Alopecia Areata is always associated with very pleasing remembrances. Believing, as I do, in the communicability of the disease, I use in the first instance an ointment made as follows:—

℞	Acidi Carbolici	ʒ j.
	Hydrarg. bisulphureti	gr. x.
	Lycopodii	gr. iv.
	Glycerini	ʒ i.
	Adipis recentis	ʒ viij.

Misce.

This I order to be well rubbed into the bald patches every night for two weeks, previously cleansing the scalp with egg and borax wash. I then direct my patient to use the stimulating pomade until the hair grows, and in no single instance have I failed to find the hair grow again. In one case, about which I was disappointed, I found the bald patches were the sequelæ of true ringworm, and resulted from the use of a parasiticide strong enough to destroy the hair follicles. In ringworm of the scalp I always refuse to treat the case, unless the child has had the head shaved, believing it to be impossible to bring any remedy into contact with the fungus unless this be done. I then direct the scalp to be well washed with a liquid made by dissolving one drachm of the Pharmacopœia soft soap and half a drachm of carbonate of potash in twelve ounces of rose water. After this is done, I direct my patient to wear a piece of lint covered with oil skin continually for a week, which lint is saturated every two hours with the following lotion :—

℞	Hydrarg. bichloridi	gr. vi.
	Acidi Carbolici	ʒ j.
	Sp. Vini Rect.	ʒ vi.
	Glycerini	ʒ vi.
	Aquæ	ad ℥ vi.

Misce.

After this has been earnestly carried out, I am sure the disease will in but few instances give further trouble. The rings will probably be scaly for some time afterwards, but if the head is kept clean, and the nitric oxide of mercury ointment of the Pharmacopœia used at intervals, the normal appearance will be resumed. I have tried stronger parasiticides on many occasions in the form of ointments, sometimes as strong applications, which I have painted on ; but the success I have met with has been very much less than when treated by the lotion. The wonderful penetrating property of the glycerine, which mixes just as readily with fat as with water, carries down the carbolic acid and bichloride of mercury to the very bottom of the hair follicles, and destroys the fungus.

In treating *tinea favosa*, I have been obliged to poultice the scalp for some days, and to take considerable pains in the removal of the cups before I could apply exactly the same treatment as for ringworm. In treating *sycosis* of the beard, I have always directed my patients to shave; and where this has been done, without so much pain and difficulty as might be expected, I have told them to bathe the affected spots with a warm lotion made with borax and carbolic acid, two drachms of the former and one drachm of the latter to the pint; afterwards, to rub in freely equal parts of the oleate of mercury and glycerine. I have tried epilation, and if it were thoroughly done, it appears the most efficacious treatment; but usually the patient will not submit to your extracting the hairs, and it is a tedious process; and if left to himself, it is but partially done, and the difficulty in bringing the remedy to the fungus is almost insurmountable; whilst by shaving, the mouths of the hair follicles are exposed, and by so doing the parasiticide is permitted to penetrate the sac.

Eczema, *pityriasis* of the scalp, *seborrhœa*, and *lichen pilaris* will often tax our ingenuity greatly. In fact, eczema of the scalp is one of the most obstinate conditions we ever meet with. It is very often but an expression of a general dartrous state, and when this is the case, requires constitutional treatment; but it is to local remedies we must look for the best results. In the first instance, the head must be well washed with the shampooing liquid, freed from all crusts, scabs, and secretion. The hair should then be cut short, and an ointment carefully and freely applied to the entire scalp, made as follows:—

℞	Hydrarg. Ammon. Chloridi	ʒ ss.
	Unguent Hydrarg. Nit. Dil.	ʒ ss.
	Lapis Calaminari	ʒ ss.
	Ol. Palmæ purificati	ʒ ss.
	Ol. Amygdal. Amar.	♏ ij.
	Vaselini	ʒ viij.

Misce.

It so often occurs that *Pityriasis* and

Psoriasis of the scalp are only expressions of a generally diseased state of the skin, that apart from the local treatment we shall have to resort to arsenic in some form. When the patient is gouty, we must combine the mineral with an alkaline; but when the skin condition occurs in the young, has a tendency to relapse, and is associated with a general depression of the state of health, we may employ the syrupus Ferri Phosphatis cum Arsenicum et Quiniæ (Corbyn & Co.), in teaspoonful doses, three times a day, with singular benefit.

1757.83 J. Wright & Co., Printers, Bristol.

THE TEST SERIES.

A New Series of Books for the Use of Students preparing for the Examinations.

These compends are based on the most popular text books and the lectures of prominent professors.

They are arranged in the most approved form, thorough and concise, with illustrations whenever they can be used to advantage.

They can be used by students of any College.

They contain information nowhere else collected in such condensed, practical shape.

Their size is such that they can be easily carried in the pocket, and the price is low.

LIST OF VOLUMES.

QUESTIONS ON ANATOMY. By Samuel O. L. Potter, M.D. 63 Illustrations. Now ready. 3s. 6d.

PRACTICE, Part I. By Dan. E. Hughes, M.D., Demonstrator of Clinical Medicine, Jefferson College, Philadelphia. Now ready. 3s.

PRACTICE, Part II. Same Author. Now ready. 3s.

PHYSIOLOGY, including EMBRYOLOGY. By A. P. Brubaker, Demonstrator of Physiology, Jefferson College, Philadelphia. Now ready. 3s. 6d.

VISCERAL ANATOMY. By Samuel O. L. Potter, M.D. Now ready. 3s. 6d.

MATERIA MEDICA. By Samuel L. Potter, M.D. Now ready. 3s. 6d.

CHEMISTRY. By G. Mason Ward, M.D., Demonstrator of Chemistry, Jefferson College, Philadelphia. Now ready. 3s. 6d.

OBSTETRICS. By Hy. G. Landis, A.M., M.D., Professor of Obstetrics and Diseases of Women in Starling College. Illustrations. Now ready. 3s. 6d.

SURGERY. In preparation.

HENRY KIMPTON, 82, HIGH HOLBORN, W.C.
And 13, Lambeth Palace Road, S.E.

51
UNIVERSITY OF BRISTOL
MEDICAL
LIBRARY